Trinity Consultants awnconsulting

Kilshane Energy Phase 2

Environmental Impact Assessment Report

Volume 2 – EIA Chapters

CLIENT

Kilshane Energy

DATE

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Chapter 1 – Introduction

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1. INTRODUCTION TO THE ENVIRONMENTAL IMPACT ASSESMENT REPORT

1.1 Introduction

This chapter of the EIAR introduces the Proposed Development, summarises the Environmental Impact Assessment (EIA) process, and provides an overview of the methodology used for preparing the EIAR. Details of the competency of the EIAR authors, the consultation undertaken, as well as details of any additional environmental related reports and/or assessments that are required under Legalisation or EU Directives other than the EIA Directive (Directive 2011/92/EU as amended by 2014/52/EU) are herein outlined.

This Environmental Impact Assessment Report (EIAR) has been prepared in respect of the Proposed Development which comprises the construction of two additional gas turbines with an output of 340 Megawatts (MW) per turbine, with a total output of 680 Megawatts to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11. The application includes for:

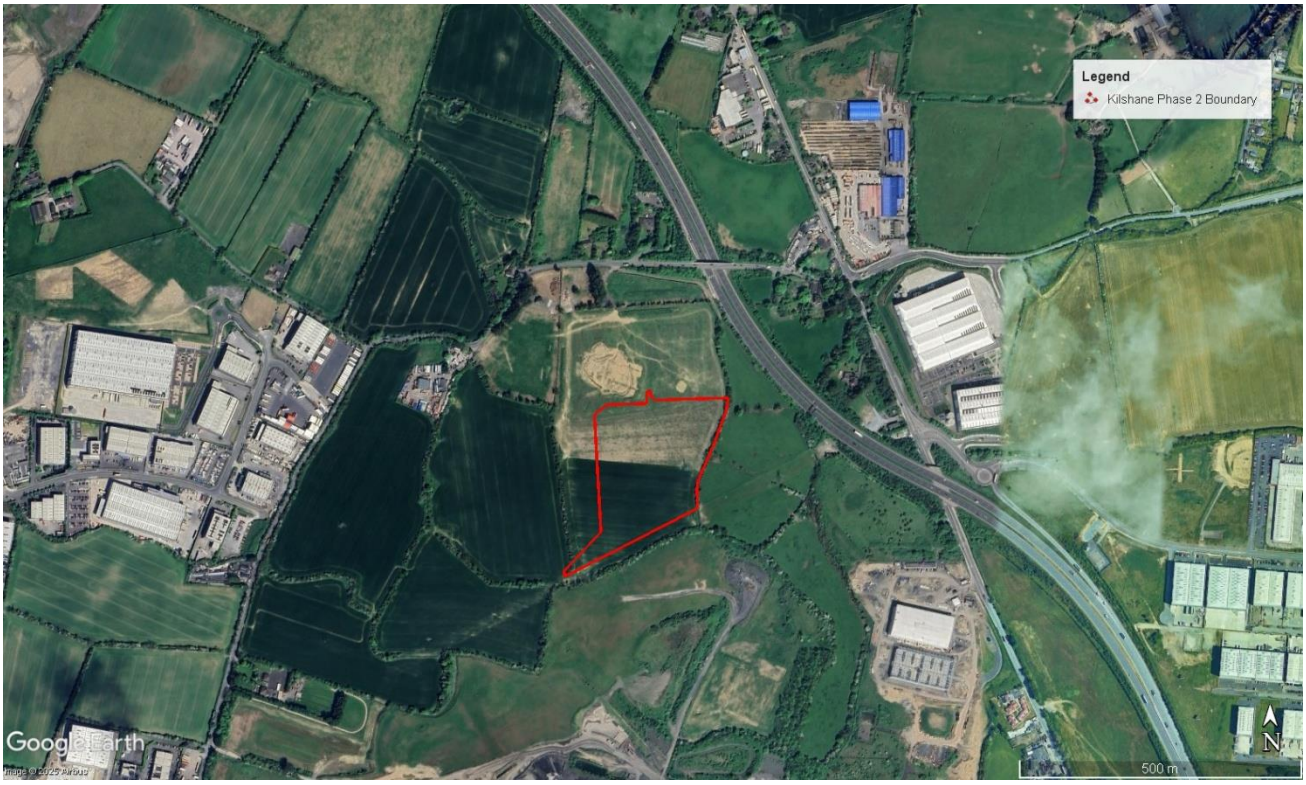
- Construction of 2 no. Gas Turbines, with an output of up to 340 Megawatts (MW) each, along with ancillary structures and equipment associated with each of the two turbines. Each of the turbines will have an exhaust stack with a height of c. 28m.
- Adjacent to each of the turbines, the development will also comprise 1 no. single storey Packaged Electrical and Electronic Control Centre (PEECC); fan cooler systems; 1 no. single storey Continuous Emission Monitoring System (CEMS) Shelter, and associated plant and equipment.
- Adjacent to each of the gas turbines, the development includes 2 no. Air Insulated Substations (AIS) to house transformers and electrical equipment within fenced compounds.
- The proposed development will be bound to its northern and part of its eastern boundary by acoustic fencing.
- Construction of a 400kV GIS building and associated electrical equipment located to the northwest of the site, within a fenced compound.
- Provision of hard and soft landscaping works, tree planting and boundary treatments.
- Attenuation storage will be located to the southeast of the site, alongside the existing permitted attenuation storage.

The proposals will be provided on two areas of stone surfacing. Access and service roads are proposed. Additional planting is proposed across the site and all associated works. The development includes underground services, parking, lighting, and associated site development and excavation works, above and below ground, necessary to facilitate the development

The Proposed Development is c. 5.33 hectares (ha) and is part of a larger landholding pertaining to Kilshane Energy. The overall site area for the Kilshane site, including Proposed Development site area is equal to 27.04 ha. The Proposed Development site is located at Kilshane, Dublin 11, west of the N2 Primary Road and approximately 2 km north-west of the M50 motorway. The Proposed Development site is located c. 2.7km west from Dublin's airport runway and c. 9km northwest from Dublin City Centre. The Proposed Development site bounded to the west, north and south by Kilshane lands and to the east by agricultural lands.

The Huntstown Quarry is located in close proximity to the south. The greater area is largely characterized by agricultural lands, commercial and industrial development, road network and a few scattered residential dwellings. The Proposed Development Site Aerial View is shown in Figure 1.1 below.

Figure 1.1 Proposed Development Site Aerial View (Source: Google Earth Pro)



The lands have an established history of agricultural use, however, the application lands are subject to "HI - Heavy Industry" zoning as per Fingal County Development Plan 2023 – 2029, with the objective to provide for Provide for heavy industry. Therefore, the Proposed Development is considered to be in line with the zoning objective of the lands.

The Planning Report prepared by John Spain Associates (JSA) and included with this application sets out the planning history of the site and identifies how the Proposed Development accords with the policies and objectives of the Fingal Development Plan 2023 – 2029. Where relevant, accordance with specific objectives is discussed within individual chapters of the EIAR.

A detailed description of the Proposed Development and the development site context is presented in Chapter 2 (Description of the Proposed Development).

1.1.1 Company Background

Kilshane Energy is a new entrant in the Irish Energy Market. They are currently developing a 293MW Open Cycle Gas Turbine plant (Phase 1) that is expected to be completed in Q2 28 on lands adjacent to the Proposed Development. Phase 1 is the same technology as the Proposed Development. Open cycle gas turbines are fast start peaking plants whose design enables them to support Ireland's national transition to sustainable renewable energy sources in line with the targets set for 2030 and beyond.

1.1.2 Need for Development

A Flexible Peaking Plant is a Gas Turbine Power Generation Station that can quickly dispatch power to balance fluctuating electricity demand in the grid due to intermittent renewable supplies. It is also used to provide a reliable source of backup generation for operating in times of high electricity demand and low renewable electricity supply. These peaking plants are crucial to avoid power outages and ensuring the security of electricity supply in a grid with increased renewable sources of energy.

The Proposed Development will act as a reliable source of backup generation when the system margins are tight. It is forecast to displace the running of existing, higher carbon emitting units such as oil-fired units. By displacing higher emitting units, the Proposed Development is expected to provide a reduction in the level of carbon emissions. This short-term displacement conforms with overall goals both of achieving targets for reduced emissions and also increasing the generation capacity of the grid to ensure security of supply. The flexible technology chosen will help facilitate a higher penetration of renewable generation being dispatched onto the system.

The proposals would assist in achieving a Key Target set out in the Climate Action Plan 2025 to provide new flexible gas plants to prove at least 2GW by 2030. This KPI is set out at Page 70 of the Climate Action Plan.

1.2 Relevant Legislative Requirement for Environmental Impact Assessment

EIA is an essential tool in the implementation of EU environmental legislation. According to the Guidelines for Planning Authorities and An Bord Pleanála (ABP) on carrying out Environmental Impact Assessment (August 2018) the objective of the Directive 2011/92/EU as amended by 2014/52/EU ('the EIA Directive'), is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for 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 EIAR 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 process involves the preparation of an EIAR by the applicant. This report is then subjected to review by the competent authority, who will also consult with the public and the relevant prescribed bodies. The competent authority will consider the EIAR as well as any other pertinent information before arriving at a reasoned conclusion regarding the probable significant effects of the Proposed Development on the environment.

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 (2022) 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 AWN have identified the thresholds of relevance to the proposal from Part 2 of Schedule 5; outlined in Table 1.1.

Table 1.1 Relevant Part 2 Schedule 5 Thresholds for EIA and determination of requirement of EIA

Development for the Purposes of:	Related Development Details	Exceeds Threshold?
3. Energy Industry (a) Industrial installations for the production of electricity, steam and hot water not included in Part 1 of this Schedule with a heat output of 300 megawatts or more	The Proposed Development site features an Energy Centre with a total production capacity of 680MW. The Proposed Development site exceeds the 300 megawatts quantity set out in Class 3(a); therefore, an EIA is mandatory under this Project Class.	Yes – EIA is mandatory under this class.

1.2.1 Relevant Legislation, Policy, and Guidelines

This EIA Report has been prepared in accordance with the most relevant guidance and legalisation, 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);
- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022);
- *European Commission,* Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended) (European Commission, 2017);
- *European Commission,* Environmental Impact Assessment of Projects Guidance on Screening (Directive 2011/92/EU as amended) (European Commission, 2017); and
- *Guidance on the preparation of the Environmental Impact Assessment Report* (European Commission, 2017.

1.3 Format of the EIA Report

This EIAR has been laid out using the grouped format structure, the report examines each environmental factor in a separate chapter (the chapters are listed in Table 1.2). These EIAR chapters have been prepared by 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;
- Monitoring or Reinstatement Measures;
- Residual Effects of the Proposed Development; and
- Cumulative Impacts of the Proposed Development

While the EIAR has the focus on the Proposed Development, each specialist chapters also consider 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 EIA Scoping and Consultation Processes

The scope of the EIAR has been defined at an early stage of the design process, the scoping process involves defining the scope of the EIAR early on in the design process to ensure that all relevant environmental issues are addressed in the subsequent studies.

To establish the scope, a comprehensive review of the development site's context, including its locality and any previously permitted developments, is undertaken. This review helps identify the specific matters that need to be covered within the environmental impact assessment. By identifying and addressing these issues upfront, the EIAR aims to provide a comprehensive understanding of the potential environmental impacts associated with the Proposed Development.

The structure and presentation of the EIAR is designed to facilitate the dissemination of information to the public and stakeholders. The EIAR is structured in a clear and accessible manner, allowing easy navigation through its content. Additionally, a non-technical summary is provided, which presents a concise overview of the report's main findings and conclusions. The presentation of the information is done in a way that is understandable to both technical experts and non-experts, enabling a wider audience to grasp the key findings and implications of the assessment.

Public participation in the Environmental Impact Assessment (EIA) process is facilitated through the statutory planning application process. As part of this process, the EIAR is made available to the public, allowing interested individuals and organizations to review and comment on the report. This provides an opportunity for public input, ensuring that a wide range of perspectives are considered before making decisions regarding the Proposed Development.

To further enable public access to the EIAR, information about the report is also made available through the Department of Housing, Planning, and Local Government's EIA Portal. This portal serves as a centralised platform that can be accessed by the public, stakeholders, and regulatory authorities. By utilising this portal alongside the Fingal County Council and An Coimisiún Pleanála online planning systems, broader public participation and scrutiny, as well as transparency and accountability in the EIA process is enabled.

Ensuring public awareness and involvement is a core objective of the EIAR process in Ireland. By disseminating the information contained in the EIAR, the aim is to make the public and local community aware of the likely environmental impacts of the proposed project prior to the granting of consent. This empowers the public to participate meaningfully in the decision-making process and voice their concerns or provide feedback.

The scoping and consultation are essential components of the EIAR process. The early definition of the EIAR scope ensures that all pertinent environmental issues are addressed, while the structure and presentation of the report, along with the provision of a non-technical summary, facilitates the dissemination of information. Public participation is actively encouraged through the statutory planning application process and the Department's EIA Portal, aiming to ensure that the public and local community are informed and have a voice in the decision-making process regarding Proposed Developments.

A pre-application consultation request has been submitted to An Coimisiún Pleanála by John Spain Associates on 24 December 2025 on behalf of Kilshane Energy ltd. in respect of the Proposed Development. Feedback from this consultation was incorporated into the design of the Proposed Development and into the environmental considerations assessed in this EIAR.

1.3.2 Contributors to the EIA Report

The preparation and co-ordination of this EIAR have 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.

Table 1.2 below outlines the specific responsibilities of each author(s) and their corresponding EIAR chapter(s). Further information regarding the qualifications and relevant experience of the EIAR team can be found below the table.

Table 1.2 Roles and Responsibilities in the EIA Report

EIA Chapter No.	Chapter Title	Company and Consultant
	Non-Technical Summary	AWN; Input from each specialist
Chapter 1	Introduction	AWN; Natalie Machado and Teri Hayes
Chapter 2	Description of the Proposed Development	AWN; Natalie Machado and Teri Hayes
Chapter 3	Alternatives	AWN; Ana Neary and Teri Hayes
Chapter 4	Population and Human Health	AWN; Natalie Machado and Teri Hayes
Chapter 5	Land, Soils, and Geology	AWN; Denis Power and Marcelo Allende
Chapter 6	Hydrology and Hydrogeology	AWN; Denis Power and Marcelo Allende
Chapter 7	Biodiversity (including AA Screening Report)	Altemar; Bryan Deegan
Chapter 8	Air Quality	AWN; Jovanna Arndt
Chapter 9	Climate	AWN; Jovanna Arndt
Chapter 10	Noise and Vibration	AWN; Mike Simms, Justin Kwan
Chapter 11	Landscape and Visual	Macro Works; Cian Doughan
Chapter 12	Archaeological, Architectural and Cultural Heritage	CRDS; Stephan Mandal
Chapter 13	Traffic and Transportation	Waterman Moylan; Fernando De Maio, Stephen Dent-Neville
Chapter 14	Material Assets - Utilities	Waterman Moylan; Mark Duignan, Kevin Muhia
Chapter 15	Material Assets – Waste Management	AWN; Laura Griffin, Chonaill Bradley
Chapter 16	Interactions – Interrelationship between the Aspects	AWN; Input from each specialist

1.3.2.1 EIA Project Team Qualifications and Relevant Experience

Project Director/EIA Co-ordinator/Selected Chapters

Teri Hayes, BSc MSc PGeo Ad Dip Env & Planning. Teri is a member and former president of the International Association of Hydrogeologists (Irish Group) and a professional Member of the Institute of Geologists. Teri is a director with AWN Consulting with 30 years of experience in water resource

management and environmental assessment and remediation. Teri has contributed to numerous environmental impact assessments and design of appropriate mitigation measures, acted as an expert witness at public hearings, lectured in EIA and providing expert advice on EIA sections for planning authorities. She has qualified for the register of "competent person" for contaminated land assessment as required by the EPA under the Institute of Geologists of Ireland and has completed a Diploma in Environmental and planning law.

EIA Co-ordinator/Selected Chapters

Natalie Machado. Natalie is a Senior Environmental Consultant with AWN Consulting and holds an MBA in Project Management & Environmental Sustainability and a BSc in Biological Sciences. Natalie specializes in Environmental Impact Assessment (EIA) and has prepared and managed numerous Environmental Impact Assessment Reports (EIARs) and EIA Screenings for a diverse range of projects across Ireland. Natalie has experience managing multidisciplinary teams and also brings a background in freshwater ecotoxicology, applied ecology, and scientific research to her role.

Alternatives

Teri Hayes (as above).

Ana Neary. Ana is a Graduate Environmental Consultant at AWN with ongoing roles in the soil and water department. Ana holds a BSc in Sustainability with Social Sciences, Policy, and Law from University College Dublin, and is a graduate member of the Institute of Sustainability and Environmental Professionals (GradISEP). She has experience in projects including EIA Reports and EIA Screening Reports for developments including ICT facilities, renewable energy developments, and large residential developments.

Population and Human Health

Teri Hayes (as above).

Natalie Machado (as above)

Land, Soils, Geology, Hydrogeology, and Hydrology

Marcelo Allende. Marcelo is a Principal Environmental Consultant (Hydrologist) 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, geo-environmental impact assessments, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments, Due Diligence reporting, baselines studies, soils, surface water 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. He also has detailed knowledge of environmental guidance, legislation, regulations & standards and expertise in GIS (expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (Irish Group) and a member of Engineers Ireland (MIEI).

Denis Power is a junior environmental consultant at AWN with 3 years of experience in water, noise and air monitoring and reporting. Denis holds a degree in environmental management and urban planning and has studied in Utrecht university's earth surface and water masters programme.

Biodiversity

Bryan Deegan. Bryan Deegan is the managing director of Altemar. Bryan is an environmental scientist and marine biologist with 28 years' experience working in Irish terrestrial and aquatic environments,

providing services to the State, Semi-State and industry. Bryan Deegan (MCIEEM) holds an MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture).

Air Quality/ Climate

Dr. Jovanna Arndt. a Principal Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc. in Environmental Science and a Ph.D. in Atmospheric Chemistry from University College Cork. She is an Associate Member of both the Institute of Air Quality Management and the Institute of Environmental Sciences. She has been specialising in the area of air quality and climate over 8 years and has prepared air quality and climate assessments for inclusion within EIARs for residential developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), commercial and industrial developments by Dublin Airport Authority, Zoetis, Ipsen, Merck Millipore, Greener Ideas Limited and Abbvie, as well as renewable energy developments such as Codling Wind Park and the Cúil Na Móna Anaerobic Digestion Facility. She also specialises in assessing air quality impacts using air dispersion modelling of transportation schemes such as BusConnects Dublin, major Highways England Road schemes and major rail infrastructure in the form of High Speed 2 (HS2 in the UK). She has prepared air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Microsoft, Greener Ideas Limited, Merck Millipore, Lilly Limerick, Chemifloc, Takeda, Kingspan and Kilshane Energy. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils and assessed the air quality impacts of potential Clean Air Zones in the UK.

Noise and Vibration

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

Justin Kwan. Justin Kwan (Senior Acoustic Consultant) graduated from the University of Leeds with a MEng, PhD (Mechanical Engineering). He is a member of the Institute of Acoustics (MIOA). He has been working in the field of acoustics since 2000 and has extensive experience in all aspects of building acoustics including acoustic products, design and specification of key building elements, laboratory testing as well as field tests.

Landscape and Visual Impact Assessment

Cian Doughan. Cian Doughan (BLSA, MILI) is an Associate Director at Macro Works with 8 years of LVIA experience working on a wide range of development types. Macro Works Ltd is a specialist LVIA company with over 20 years of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments. Relevant experience includes LVIA work on large-scale industrial developments, linear infrastructure development, and a wide range of commercial and residential developments throughout Ireland. Macro Works are also specialist LVIA consultants for the renewable energy industry working on over 140 no. on-shore wind farm proposals throughout Ireland, including numerous Strategic Infrastructure Development (SID) projects in addition to over 200 no solar farm developments. Macro Works and its senior staff members are affiliated with the Irish Landscape Institute..

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

Stephen Dent-Neville. Stephen Dent-Neville is a Chartered Engineer with 13 years' experience. B.A., B.A.I., Trinity College Dublin (2008-2012) – Degree Course: Civil, Structural and Environmental Engineering. CEng Chartered Member of the Institute of Engineers Ireland 2020.

Fernando De Maio. Fernando De Maio is a Civil Engineer with over 11 years' experience Civil Engineer (2007-2014) Degree Course, Buenos Aires University, Argentina. Transport Policy and Planning Specialist (2015-2016) – Post-Degree Course, San Martin University, Argentina.

Material Assets – Utilities

Mark Duignan. Mark Duignan is a Chartered Engineer with over 21 years' experience. B.A., B.A.I., Trinity College (2000-2005) - Degree Course: Civil, Structural, Transportation and Environmental Engineering, Trinity College, Dublin. CEng Chartered Member of the Institute of Engineers Ireland 2013. RConsEI ACEI Registered Professional Consulting Engineer 2016.

Kevin Muhia. Kevin Muhia is a Civil Engineer with 4 years' experience. BSc. Civil Engineering (2015-2020) – Degree course, University of Nairobi, Kenya. MSc. (Eng) Transport Planning and Engineering – Master's Degree Course, University of Leeds, United Kingdom. MIEI Member of the Institute of Engineers Ireland 2025.

Material Assets - Waste Management

Laura Griffin. Laura Griffin is a Senior Environmental Consultant in the Environment Team at AWN. Laura holds a Master of Science (Hons) in Climate Change from Maynooth University and a Bachelor of Arts (Hons) in English and Geography. She has over five years of professional experience and specialises in preparing Environmental Impact Assessment (EIA) Screening Reports and Environmental Impact Assessment Report (EIAR) chapters for developments of a similar scale and nature to the Proposed Development.

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

1.4 Description of Effects

The quality, magnitude and duration of potential effects are defined within each specialist chapter of this EIA in accordance with the criteria provided in the EPA *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (2022) as outlined in Table 1.3.

Table 1.3 Description of Effects as per EPA Guidelines (2022)

Effect Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	A change which does not affect the quality of the environment
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not Significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Duration of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
	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.

Effect Characteristic	Term	Description
Type of Effects[1]	'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 Legalisation or EU Directives other than the EIA Directive in respect of the Proposed Development are described in this section.

1.5.1 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 Habitats Directive is the cornerstone of habitats and species protection in Ireland. The Habitats Directive (92/43/EEC) and the associated Birds Directive (2009/147/EC) are transposed into Irish legislation by Part XAB of the 2000 Act and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) as amended.

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.

An AA Screening has been prepared for the Proposed Development by Bryan Deegan (Altemar ltd) and is included with the planning application (Chapter 7 – Appendix 7.1).

1.5.2 Water Framework Directive (Directive 2000/60/EC)

The Water Framework Directive (WFD) 2000/60/EC aims to protect and enhance the quality of the water environment (both surface water and groundwater) across all European Union member states. The WFD requires all EU member states to classify the current condition or 'status or potential' of surface and groundwater bodies and to set a series of objectives for maintaining or improving conditions so that water

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

bodies maintain or reach 'good status or potential' during the next river basin management planning cycle. Environmental Protection Agency (EPA) and other stakeholders such as planning authorities are the competent authority for implementing the WFD in Ireland. As part of their role, these authorities must consider whether proposals for new developments (other than where exemptions apply) have the potential to:

- Cause a deterioration of a water body from its current status or potential; and/or
- Prevent future attainment of good status or potential where not already achieved.

As a result, new developments that have the potential to impact on current or predicted WFD status are required to determine whether the project will cause a deterioration of the status of the body of surface water or if it would jeopardise the attainment of good surface water status, having regard to the existing status of the water body as designated in accordance with the Directive.

A WFD Assessment has been undertaken for the Proposed Development, the results of which are presented in Appendix 6.3 of Chapter 6 (Hydrology & Hydrogeology).

1.5.3 Industrial Emissions Directive (Directive 2010/75/EU) and Large Combustion Plant Directive

The Industrial Emissions Directive 2010/75/EU was transposed into Irish law by under the European Union (Industrial Emissions) Regulations 2013, S.I. 138 of 2013.

The Regulations primarily amend the Environmental Protection Agency (EPA) Act 1992 (as amended) to introduce a system of licensable activities. The First Schedule of EPA Act 1992 lists the activities that are licensable.

An Industrials Emissions Directive ("IED") licence application is required for the Proposed Development under Class 2.1 "Combustion of fuels in installations with a total rated thermal input of 50 MW or more.

The permitted development of reference FW22A/0204 is regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01, which sets out limits and monitoring requirements for noise, air, water, and foul emissions from the Kilshane site. It is anticipated that a licence review will be required to reflect the design changes at the site resulting from the Proposed Development. The Proposed Development will operate within the licensed emission limits for the Kilshane site, and that no environmental exceedances are expected to occur as a result of the additional turbines.

The most relevant BAT sector document for the activities at the installation is the Commissions Implementing Decision (EU) 2021/2326 of 30 November 2021 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants. The BAT for LCP applies to plants with a rated thermal input of 50 MW_{th} or more, and is therefore applicable to the Proposed Development as it will have an output of 680 Megawatts (MW).

1.5.4 Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC and Directive 2012/18/EU) and COMAH Regulations (S.I. No. 209 of 2015)

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as

possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The Permitted Development of reference FW22A/0204/ABP-317480-23 at the Kilshane site includes large amounts of diesel fuel storage for turbine operations and is therefore classified as a Lower Tier Seveso establishment. As such, the Kilshane site will be subject to the provisions of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015.

In support of the Proposed Development, a Significant Modifications Assessment has been prepared by AWN Consulting and will be sent to the Health and Safety Authority (HSA). This assessment has been prepared in order to determine whether the installation of the 2 No. Open Cycle Gas Turbines (OCGT) at the Kilshane site, included as part of the Proposed Development, would be considered a 'significant modification' under the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, S.I. 209 of 2015 (COMAH Regulations 2015).

1.5.5 Landscape and Visual Impact Assessment

The assessment of Landscape and Visual Impact, prepared by Macro Works, is set out in Chapter 11 of this EIAR. The assessment was carried out in accordance with the *Guidelines for Landscape and Visual Impact 3rd Edition* (Landscape Institute and IEMA, 2013). Various viewpoints have been selected to provide a well-rounded and realistic representation of how the development will look from different aspects and demonstrate views from sensitive receptors. Views have been selected from specific locations where more expansive views are possible. A supporting appendix of CGI modelled verified views has been also prepared by Macro Works and included as a stand-alone volume to this EIAR.

Chapter 2 – Description of Proposed Development

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2. DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 Introduction

As described in Chapter 1 (Introduction), the Kilshane Energy is applying for the construction of two additional gas turbines with an output of 680 Megawatts (MW) to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11. The Proposed Development (Phase 2) will consist of the following:

- 2 additional gas turbines producing 340MW each
- 400kV GIS building and associated compound
- Access roads
- Electrical substation.

Diesel for these two turbines will be stored and supplied from a dual-containment tank permitted under planning reference FW22A/0204/ABP-317480-23 as amended by FW25A/0523E.

The following chapter presents a description of the Proposed Development as required by the relevant planning legislation, 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive) and the EPA "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports" (2022) (herein referred to the as the EPA EIA Report Guidelines 2022) and the EPA Draft "Advice Notes for Preparing Environmental Impact Statements" (2015) (herein referred to as the EPA Draft Advice Notes for EIS 2015).

2.2 DESCRIPTION OF THE EXISTING DEVELOPMENT SITE

2.2.1 Site Location and Context

The Proposed Development redline area will comprise 5.22 hectares (ha) in extent and will form part of a larger landholding pertaining to Kilshane Energy. The overall site area for the Kilshane site, including Proposed Development site area is equal to 27.04 ha.

The Proposed Development will be a continuation of the Permitted Development of reference FW22A/0204/ABP-317480-23, not yet in construction, which will comprise the construction of a Gas Turbine Power Generation Station. For the purposes of this assessment, the development of reference FW22A/0204/ABP-317480-23 will be referred as "Permitted Development". The Permitted Development is described in further detail in Section 2.2.3.1 of this chapter.

It is noted that the Permitted Development has been subsequently amended in April 2026 by Planning Application Reg. Ref. FW25A/0523E, including changes to some of the permitted elements such as the administration building, the power island layout, changes to the fuel storage tank with an increase in the fuel storage capacity from 6,246 m³ to 27,430 m³, among others. These amendments are described in further detail in Section 2.2.3.2 of this chapter.

The Kilshane Energy site is located at Kilshane, Dublin 11, west of the N2 Primary Road and approximately 2 km north-west of the M50. The Proposed Development area exists at present is mostly greenfield and bareground, with tree lines existent along the Kilshane site boundary. The site's topography generally slopes from west to east with a high point of 80.50m OD Malin on the western boundary, and a low point of 77.54m OD Malin on the eastern boundary.

The Proposed Development site bounded to the west, north and south by Kilshane lands and to the east by agricultural lands. The Huntstown Quarry is located in close proximity to the south. The greater area

is largely characterized by agricultural lands, commercial and industrial development, road network and a few scattered residential dwellings.

The Proposed Development will be situated to the northern portion of the proposed redline boundary and to the south of the already permitted turbine (Reg. Ref. ABP-317480-23). Topographic surveys and OS details indicate that the existing boundary hedgerows at the development site contain local ditches which convey surface water flows from rainfall in a north-easterly direction until eventually joining the River Ward at St. Margaret's Golf and Country Club. The River Ward is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary.

The nearest waterbody to the Proposed Development is the Huntstown Stream (EPA_Name: Huntstown 08) located to the south c. 30m from the site boundary. From this point the Huntstown Stream flows in a north-easternly direction, until also joining the River Ward at St. Margaret's Golf and Country Club and eventually discharging into the Malahide Estuary, approximately 14km downstream. The Malahide Estuary is a Special Protection Area (SPA), a candidate Special Area of Conservation (cSAC), a proposed National heritage Area (pNHA) and a RAMSAR site.

The nearest sensitive receptors to the Proposed Development site are the dwellings located approximately 210m - 320m to the north-west, north-east and east of the site. Two dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89), which are located to the north of Proposed Development along Kilshane Road have been previously identified as the nearest sensitive receptors for the Permitted Development (Reg.Ref. ABP-317480-23) and are due to be demolished under An Coimisiún Pleanála Case reference: PL06F.321196 / Planning Authority Case Reference: FW24A/0339E. The dwelling site will be converted into a storage container depot and therefore, they are not considered to remain as sensitive receptors for the Proposed Development.

2.2.2 Industrial Emissions License

The Permitted Development is regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01, which sets out limits and monitoring requirements for noise, air, and water emissions from the Kilshane site.

It is anticipated that a licence review will be required to reflect the design changes at the site resulting from the Proposed Development.

The Proposed Development will operate within the licensed emission limits for the Kilshane site, and no environmental exceedances are expected to occur as a result of the additional turbines.

2.2.3 Existing and Permitted Site Utilities, Infrastructure and Access

As previously stated, the proposed Phase 2 will be a continuation of the Permitted Development. As such, the majority of the utilities and infrastructure already permitted under the existing planning permission will be utilised to service the Proposed Development, with upgrades carried out where required to accommodate the additional phases.

The Permitted Development will be constructed prior to the Proposed Development respective to this application, as such, the baseline for the 'existing infrastructure' available will be considered as defined and approved under Permitted Development and subsequent amendments. This approach will ensure consistency in assessing the infrastructure capacity.

2.2.3.1 Permitted Development (FW22A/0204/ ABP-317480-23)

The Permitted Development consists of:

- The construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts. The permitted station will consist of 1 no. Gas Turbine and 1 no. 28 m high Exhaust Stack partially enclosed by a 12 m high acoustic wall. 1 no. single storey Admin Building and Warehouse (c. 926 m^2), 1 no. single storey Packaged Electronic/Electrical Control Compartment (PEECC) (c. 72 m^2), 1 no. single storey Continuous Emission Monitoring System (CEMS) Shelter (c. 14.8 m^2), 1 no. 16.2m high x 024.4m Fuel Oil Tank, 1 no. 15.3m high x 09.2m Raw/Fire Water Tank, 1 no. 16.2m high x 018.3m Demin Water Tank, and miscellaneous plant equipment.
- The demolition of a detached residential dwelling (c. 142 m^2 GFA) and associated farm buildings (c. 427 m^2 GFA) located in the north west corner of the subject site to facilitate the proposed development.
- Road improvement works to 493.34 m Kilshane Road (L3120), including the realignment of a portion of the road (293.86 m) within the subject site boundary and the provision of new footpaths, off-road cycle ways, together with the construction of a new roundabout linking the proposed realignment of Kilshane Road back to the existing road network to the northeast of the subject site and to the proposed internal road network to serve the proposed development.
- The construction of entrance gates, low wall and railings fronting the realigned Kilshane Road and a private internal road network providing for vehicular, cyclist and pedestrian access to serve the development. Construction of 3 m high security fencing within development.
- Total provision of 26 no. car parking spaces, including 1 no. disabled persons parking space and 2 no. EV electrical charging points.
- Provision of security lighting columns to serve the development and the installation of Closed-Circuit Television System (CCTV) for surveillance and security purposes.
- Provision of 20 no. sheltered bicycle parking spaces.
- Provision of hard and soft landscaping works, tree planting and boundary treatments including 3 m high security fence along Kilshane Road and the perimeter of the subject site boundary.
- Provision of new on-site foul sewer pumping station to serve the development.
- Provision of underground surface water attenuation areas to serve the development.
- All associated site development and excavation works, above and below ground, necessary to facilitate the development.

2.2.3.1.1 Potable Water

In terms of water supply, there is a 50.8 uPVC watermain is located to the north of the site on the Kilshane Road. The south of the site is traversed by a 914.4mm (36") concrete watermain. This distribution main is fenced off as a protective measure.

The Permitted Development will connect to the 110mm Ø MOPVC watermain located to the southwest of the site on Kilshane Road to the 50.8 uPVC watermain adjacent to the site via a 150mm Ø watermain.

2.2.3.1.2 Foul and Process Sewer

Considering the site's topography, the Permitted Development and adjacent outline lands will be serviced by a privately managed pumping station in agreement with Uisce Éireann. The Permitted Development includes a 150mm diameter rising main from the on-site pumping station, spanning approximately 1,818 meters to link with the existing gravity foul network on Mitchelstown Road. This pumping station will provide a 24-hour storage capacity for foul flow.

2.2.3.1.3 Stormwater Drainage Systems

The Permitted Development includes various SuDS techniques designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and in the SuDS Manual. SuDs measures include permeable paving at parking areas, swales to cater to excess flows and underground attenuation systems. The storm water network has been designed with flow control manholes between the attenuation tank and the outfall headwall to limit discharges to the greenfield equivalent runoff. The permitted drainage also includes Class

1 bypass interceptors and full retention petrol interceptors before surface water outfalls to the existing ditch.

Ditches along the Kilshane site boundary will cater for most of the stormwater on site and will ultimately discharge to the Huntstown Stream, located to the south of the Kilshane site. The Kilshane site is divided into 3 catchment areas. Catchments 1 and 2 are located to the north of the site, with a total underground storage capacity of 603 m^3 and 542 m^3, respectively, while Catchment 3 is to the south of the site with a total underground storage capacity of 1,735 m^3.

In case of excess rainfall, storm water will be attenuated in the underground tanks for each catchment area within the site.

2.2.3.2 Permitted Amendments (Reg. Ref: FW25A/0523E)

The revisions to the previously approved Gas Turbine Power Generation Station (FW22A/0204/ ABP-317480-23) comprise the following amendments.

- Revisions to previously approved administrative/warehouse building consisting of the following: (a) Revised internal layout consisting of addition of new stair core and lift at ground floor level connecting to new storage area at first floor level (428 m^2 GFA), increasing the total GFA of the administrative/warehouse building from 855 m^2 to 1283 m^2. (b) Revised façade design to elevations including revised fenestration to south elevation, revised fenestration and door design to west elevation, revised fenestration to east elevation and provision of new external fire staircase and first floor level access door to east elevation. (c) Increase in height of administrative/warehouse building by 1 m to 7.38 m. (d) Revised colour of material finish from green to dark grey.
- Revisions to previously approved gas turbine including revised shape of evaporative cooler, addition of servicing gantries and the slight moving of the gas turbine c. 5.57 m to the north as demonstrated on the enclosed architectural plans (Drg No. Drawing No. 25043-PL-04.1) Internal gas turbine machinery and installation as part of revised gas turbine model to be provided to later specialist design as previously approved under Reg. Ref. FW22A/0204.
- Revised size and location of fin fan coolers within power island compound as demonstrated on enclosed architectural plans.
- Revisions to layout of diesel storage compound to now provide 1 no. larger fuel storage tank with an increase in maximum height from 16.2 m to 20 m and an increase in diameter from 24.4 m to 49 m with an increase in diesel fuel storage capacity from 6,246m^3 to 27,430m^3.
- Revised design and location of the Packaged Electronic/Electrical Control Compartment (PEECC) within the power island compound to now comprise a single storey stilted building raised 2.6 m above ground level, accessed via 2 no. external stairs and a new servicing gantry at finished floor level, with a floor-to-ceiling height of 3.25 m and an overall height of 6 m, and an increase in GFA from 72 m^2 to 148.51 m^2 together with façade changes.
- Revised design and location of BOP Power Distribution Centre within power island compound as demonstrated on enclosed architectural drawings including increase in GFA from 129 m^2 to 160.6 m^2 together with façade changes including revised fenestration to west and east elevations.
- The addition of new Aux Equipment Block (connected to the Gas Turbine) with a GFA of 361.20 m^2 and height ranging from 7.65m to 9.59m and new servicing gantries for the purposes of sheltering specialist equipment and machinery as identified on the enclosed architectural drawings.
- The addition of a HVAC Structure within power island compound with a maximum height of 8.84 m which supports two HVAC units on the top and the Starter Transformer and Excitation Transformer below.
- Revision to previously approved Acoustic Wall within power island compound consisting of a slight decrease in length from 107.0m to 101.6m.
- Removal of previously approved 16.2m high x 18.3m dia Demin Water Tank and replaced with Separate Demin Water Tank to be added as a non-permanent structure rather a small cube refill tank.

- Removal and replacement of select number of smaller equipment items as identified on the equipment identification drawings prepared by CWPA Planning & Architecture (Drawing No. 25043-PL-14).
- Minor revision to internal road network as demonstrated on enclosed architectural drawings to accommodate proposed amendments.

2.2.4 Protected Structures

The Record of Monuments and Places was consulted as part of the assessments of archaeology, architectural and cultural heritage (Chapter 12), and it has been identified that there are no recorded archaeological monuments located within the Proposed Development site boundary.

There have been a large number of archaeological excavations undertaken within the study area (including within the Proposed Development), and the site of the Proposed Development has been subjected to geophysical survey and archaeological testing. Whilst these assessments identified archaeological remains to the immediate north of the Proposed Development, no archaeological feature were identified within the Proposed Development lands.

There are three sites within the study area listed in the Record of Protected Structures for Fingal County, all of which are also listed in the Sites and Monuments Record. According to Chapter 12, none of these will be impacted, directly or indirectly, by the Proposed Development.

There are no Architectural Heritage sites located within the proposed site or in proximity to the site. Dunsoghly Castle (DU014-005001-) is located c. 0.9 kilometers (km) to the northeast and will not be impacted by the Proposed Development, directly or indirectly.

Further details on protected structures are provided in Chapter 12 of this EIAR.

2.2.5 Fingal Development Plan 2023 – 2029

The Kilshane site is zoned under Fingal County Development Plan 2023 - 2029 under "HI - Heavy Industry", with objective to provide for Provide for heavy industry. As per Fingal Development Plan 2023 – 2029, the HI zoning objective can be described as:

> *"Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."*

Having consideration of the county development plan, the Proposed Development is deemed to be in line with Fingal development objectives and is considered an appropriate form of development within the area.

2.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

2.3.1 Proposed Development Description

In line with the submitted site notice, the Proposed Development comprises 2 no. Gas Turbine Power Generation Stations, with an output of up to 340 Megawatts (MW) each, equating to a total output of up to 680MW, along associated ancillary structures, and services, including an Air Insulated Substation (AIS) adjacent to each of the turbines. The Proposed Development also includes the construction of a 400kV Gas Insulated Switchgear (GIS) substation to serve the two Generation Stations. The proposed GIS substation will be connected to the national grid by way of a 400kV transmission line connection, which will be subject to a separate application.

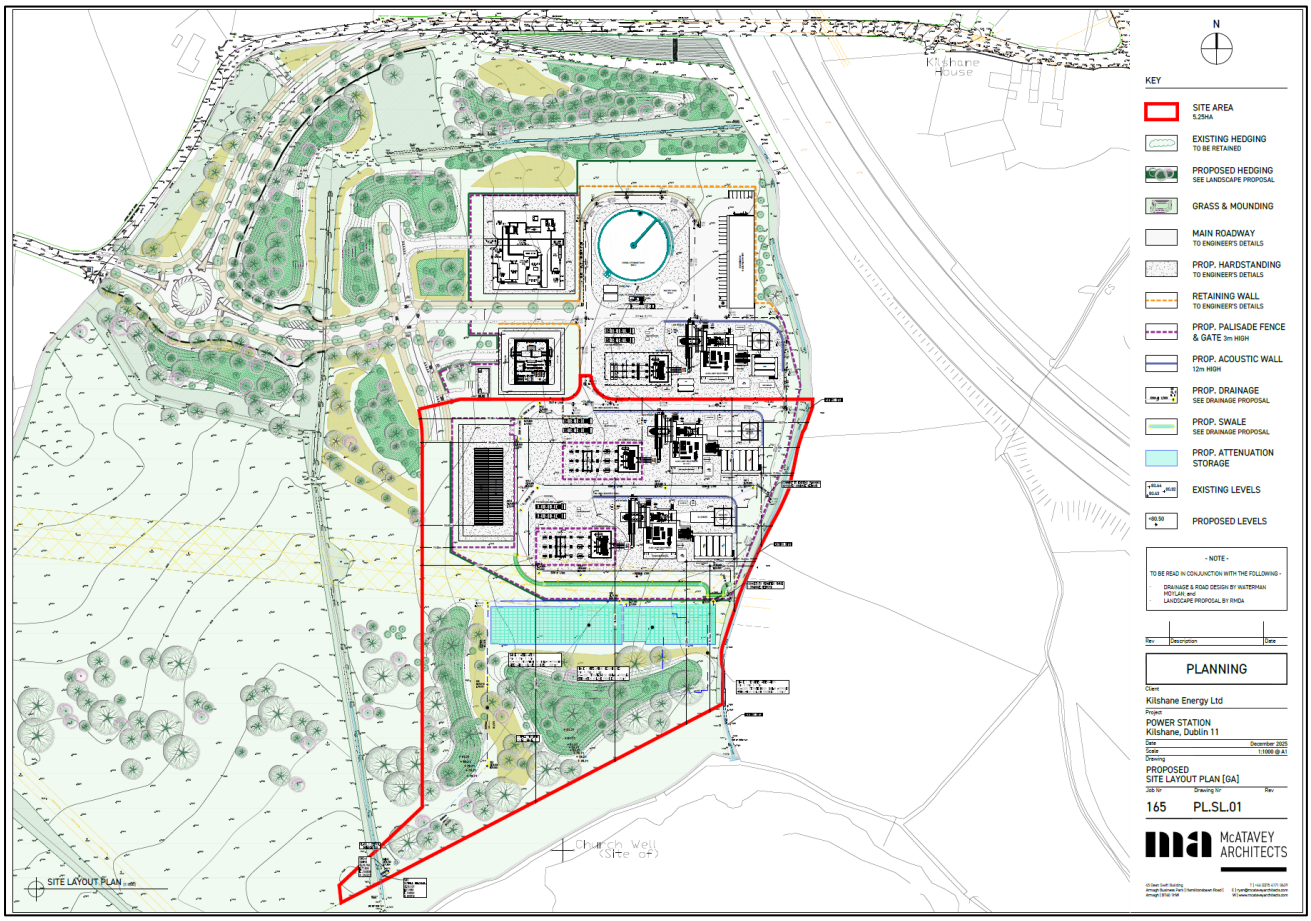
The proposals will comprise the following:

- Construction of 2 no. Gas Turbines, with an output of up to 340 Megawatts (MW) each, along with ancillary structures and equipment associated with each of the two turbines. Each of the turbines will have an exhaust stack with a height of c. 28m.
- Adjacent to each of the turbines, the development will also comprise 1 no. single storey Packaged Electrical and Electronic Control Centre (PEECC); fan cooler systems; 1 no. single storey Continuous Emission Monitoring System (CEMS) Shelter, and associated plant and equipment.
- Adjacent to each of the gas turbines, the development includes 2 no. Air Insulated Substations (AIS) to house transformers and electrical equipment within fenced compounds.
- The proposed development will be bound to its northern and part of its eastern boundary by acoustic fencing.
- Construction of a 400kV GIS building and associated electrical equipment located to the northwest of the site, within a fenced compound.
- Provision of hard and soft landscaping works, tree planting and boundary treatments.
- Attenuation storage will be located to the southeast of the site, alongside the existing permitted attenuation storage.

The proposals will be provided on two areas of stone surfacing. Access and service roads are proposed. Additional planting is proposed across the site and all associated works. The development includes underground services, parking, lighting, and associated site development and excavation works, above and below ground, necessary to facilitate the development.

The design of the Proposed Development is described in detail in the Planning Report prepared John Spain Associates (JSA), which has been included with the planning application. Figure 1 below illustrates the proposed overall site layout.

Figure 1 Site Layout Plan[1]



2.3.2 Proposed Production Process

The Proposed Development will be a continuation of the permitted fast start peaking Gas Turbine Power Plant and will provide two additional turbines for an increased energy production capacity with an output of 680 Megawatts (MW).

The power produced by the proposed and permitted turbines will be exported to the EirGrid transmission network up to the Maximum Export Capacity (MEC) as specified in the EirGrid Connection Agreement. It is proposed that while the Power plant is exporting power to the grid, it will simultaneously power the proposed and permitted infrastructure. When the Power Plant is offline, it will import power from the grid.

The Proposed Development will operate intermittently throughout the year. The plant is forecasted to operate for between 22 and 100 hours in a year per turbine with an annual average of 46 hours. The plant is required to be available to follow dispatch instructions from Eirgrid, the Transmission System Operator (TSO). The TSO will decide the actual operating hours of the unit depending on system needs at any point in time. Therefore, as a conservative/maximum hours scenario it is assumed that the Proposed Development could, if required by the TSO, have a continuous operation of all units (24/7/365).

The operation of the proposed turbines will play a role in stabilising electricity supply during periods of heightened demand or potential shortages. The energy produced by the Proposed Development, along

[1] McATAVEY ARCHITECTS, drawing no. PL.SL.01

with the Permitted Development, will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity faces limitations.

The natural gas will be supplied by a gas yard owned and operated by Gas Networks Ireland, with no fuel compression required. The gas yard, known as an Above Ground Installation (AGI), and its connection to the nearby gas main, will be subject to separate consent from the Commissioner for the Regulation of Utilities (CRU). It will be developed, owned and operated by Gas Networks Ireland.

In line with the Permitted Development, the proposed turbines will be designed for dual fuel operation. While natural gas will be the primary fuel, fuel oil will be stored and used on site as an emergency backup fuel source in the event of an interruption to the gas supply. The fuel oil will be delivered to the site via tanker trucks and will be manually pumped into the double-walled oil storage tank located at the Permitted Development footprint, north of the Proposed Development.

When required, the oil will be pumped to the turbines. Air extracted from the gas turbine's compressor will be used to atomize the fuel oil prior to combustion.

The gas turbine operated by drawing air through an inlet filter house into a compressor, where the air is pressurized and heated. This compressed air is then mixed with fuel and ignited in the combustion chambers. The resulting hot, pressurized gases expand through the turbine, spinning the shaft and generating mechanical energy.

Exhaust gases will exit the turbine through ducting and a horizontal silencer, before being released via the proposed stacks.

The electricity generated from the turbines will be fed through separate generator step up transformers located in the onsite Air Insulated Substations (AIS) which will step up the voltage from 20kV to 400kV. It will then be delivered at 400kV to the Gas Insulated Substation (GIS) where it will be transmitted to the external grid network.

The Proposed Development will operate within EPA licensed emission limits ensuring no environmental exceedances are expected to occur as a result of the additional turbines.

2.3.3 Civil Requirements

2.3.3.1 Energy

The power requirements for the Proposed Development will be provided via the proposed 400kV Gas Insulated Switchgear (GIS) compound. This GIS station will be connected to the transmission network via an underground cable connection to a nearby 400kV substation. This connection will be subject to a separate SID under Section 182 of the Planning and Development Act. Additionally, 2no. Air Insulated Substation (AIS) are proposed, one for each new turbine. The AIS will have a step-up transformer that will increase the voltage of the electricity produced in the turbines to match the 400kV voltage of the GIS.

It is proposed that when the turbine units are in operation, they will supply the site's electrical demand using their own generated power. When the turbines are offline, the site's power requirement estimated at approximately 1.5MW per hour, will be met by the grid.

There are two scenarios for annual energy production, based on EirGrid requirements:

- Expected Scenario: Assumes each unit operates for 100 hours per year per turbine.
- Conservative/Maximum Hours Scenario: Assumes continuous operation of all units (24/7/365).

The total energy production and the energy exported to the grid are summarised in the Table below.

Table 2-1 Energy production for both scenarios

Scenario	Total for site (both turbines) - MWhe	
	Annual energy production	Annual Energy exported to the grid
Expected Scenario - 100 hours running per unit	68,000	66,785
Conservative/Maximum Hours Scenario - 24/7/365 running on both units	5,956,800	5,848,024

All electrical connections will be carried out in accordance with the requirements of the relevant service provider, working around the existing and permitted infrastructure at the Kilshane site.

The Proposed Development will be tied to the permitted on-site natural gas line. No new connection to the gas mains is required outside the site boundary. The estimated additional annual gas consumption for the Proposed Development is as follows:

- Expected Scenario (100 hours running per unit)- 172,195MWht.
- Conservative/Maximum Hours Scenario (24/7/365 running on both units) - 15,084,325MWht.

Permitted telecommunication lines for telephone and broadcast services will be extended and serve the Proposed Development when operational. No new telecommunication service connection will be required.

2.3.3.2 Surface Water Infrastructure

As per the Engineering Assessment Report (Ref: 25-046r.001), the surface water drainage strategy established for Permitted Development will be maintained for Proposed Development, with the surface water runoff catered by ditches, swales for excess flows and upsizing the underground attenuation.

Stormwater will be attenuated in a series of underground modular tanks located on the southern side of the site, which have been upsized to cater for the permitted and proposed developments. As for the permitted design, discharge is pumped post attenuation at the greenfield equivalent runoff rate for c. 116.3 m before outfalling by gravity to the existing field ditch at the southwestern corner of the site. This ultimately discharges to the Huntstown Stream to the south of the site. The Permitted Development has an attenuation volume of 1,245.2 m^3 and a greenfield runoff rate of 8.59 l/s while the Proposed Phase 2 development requires an attenuation volume of 1,852.2 m^3 and a greenfield runoff of 7.45 l/s giving a total required attenuation volume of 3,097.4 m^3 and a discharge rate of 16.04 l/s. The flow control manholes will be in place between the attenuation tank and the outfall headwall and will limit discharges to the greenfield equivalent runoff. The Phase 1 flow control pump will be also upsized to accommodate additional runoff. The already permitted Class 1 bypass interceptors and full retention petrol interceptors will mitigate against contamination arising from potential spills or leaks. These interceptors will be located before ditch outfall.

For further details on the proposed surface water infrastructure, please refer to the Engineering Assessment Report (Ref: 25-046r.001) prepared by Waterman Moylan and included as part of this planning application.

2.3.3.3 Foul Sewer and Process Wastewater Infrastructure

During the operational phase, the primary sources of foul water discharge for the Proposed Development will originate from potential additional workers. Typical domestic foul emissions will also occur, originating from the already permitted canteens and toilet facilities.

The Proposed Development will be reliant on the permitted Phase 1 foul water network and pumping station (Confirmation of Feasibility: CDS22004080), which consists of a gravity network which is then pumped south in an 80mm rising main for 1,823m along Kilshane Road to connect to the foul gravity network on Mitchelstown Road.

There will be an increase of 10 no. operational staff as a result of Proposed Development, however, the previously permitted foul pumping station and rising main have been designed with additional capacity to cater for potential future developments, part of the masterplan at the Kilshane site.

The permitted foul scheme has been designed with the capacity to cater for an additional 11 no., future industrial units with an additional 743 staff. This represents an additional dry weather flow capacity of 0.946 l/s and peak flow of 2.838l/s. The total dry weather flow generated as a result of the Proposed Development from the development will be 0.013 1/s, with a peak flow of 0.059 1/s. As such, an upgrade of the Phase 1 development welfare facilities is not required to accommodate this staff increase.

The proposed GIS compound will tie into the permitted foul network and will utilize the permitted pumping station. The GIS compound will not contribute to the operational foul flow volumes. The GIS compound will operate as an unmanned site under normal conditions. Personnel will only be present during scheduled maintenance activities within the substation.

As such, it is understood that the permitted infrastructure has sufficient capacity to cater for the minor foul increase resulting from the Proposed Development.

2.3.3.4 Water Supply

As part of the Proposed Development, it is proposed to connect to the permitted Phase 1 watermain network under Reg. Ref. ABP-317480-23 via a 250mm ⌀ watermain which will loop around the subject site.

Due to the nature of the site, water storage will need to be maintained on site for firefighting purposes. Water storage for firefighting will be constructed to the north of the Proposed Development as part of the Permitted Development with a total storage volume of 850 m^3. The firewater will serve both phases of the project.

Overall, the calculations of the additional water demand generated as from Proposed Development operations resulted in an average demand of 0.01271/s, with a peak demand of 0.0795I/s.

As mentioned above, the previously permitted water supply infrastructure at the Kilshane site has been sized and designed to accommodate future developments as part of the site's masterplan including the Proposed Development. As such, the permitted infrastructure has sufficient capacity to cater for the minor increase in water demand resulting from Proposed Development. The proposed water infrastructure will tie into the permitted water supply network with no major upgrades required.

A Pre-Connection Enquiry has been submitted to Uisce Eireann requesting a Confirmation of Feasibility (CoF), under CDS25004544 and advises that the proposed water supply connection is feasible within infrastructure upgrades to the existing water supply network.

2.3.3.5 Security and Lighting

The gates and overall site will be security controlled and monitored by Closed-Circuit Television System (CCTV) 24/7. The development will be enclosed by a 3 m high security fencing and the main access point at the site will be the permitted permanent vehicular entrance on the Kilshane Road.

The Proposed Development will require new external lighting. All lighting used during both the construction and operational phases will be designed to ensure no light spillage offsite to nearby habitats. Artificial

lighting will consist of energy efficient LED luminaires with the lighting design optimised to deliver the required illumination levels for the different areas.

2.3.4 Waste Management

The Proposed Development waste management operations will be integrated with the Permitted Development. Once operational, the Proposed Development will adhere to the waste protocols for the Kilshane site and will be subject to the conditions of an Industrial Emissions Licence which will also regulate waste management onsite.

2.3.5 Site Roads, Access, and Parking

2.3.5.1.1 Operation Phase

Once operational, the project site will remain accessible via the permitted main entrance on Kilshane Road. The Proposed Development includes modifications and expansion of the permitted internal road network, road markings and statutory signage. The permitted and proposed internal access roads and footpath will allow safe access through the Site and all proposed changes will be identified by signage.

The Proposed Development will not include new carparking spaces, and parking availability will remain as per Permitted Development with 26 no. car parking spaces including 1 no. disabled persons parking space and 2 no. EV electrical charging points. Parking will be available by the permitted Administration/Warehouse building, outside the Proposed Development redline.

2.4 DESCRIPTION OF THE PROJECT LIFECYCLE

Under the EPA EIA Report Guidelines 2022, the description of the existence of the project is required to define all aspects of the proposed lifecycle of the Proposed Development under the following headings:

- Construction;
- Commissioning;
- Operation;
- Decommissioning; and
- Description of Other Developments.

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

2.4.1 Description of the Construction Phase

The construction of the development will comprise three main stages, namely;

- Site preparation works;
- Construction; and
- Commissioning.
- Decommissioning

2.4.1.1 Working Hours

It is anticipated that the construction of the Proposed Development will be completed during will be completed during 07:00 to 19:00 Monday to Saturdays inclusive, no works will take place Sundays or public holidays.

2.4.1.2 Staffing and Construction Parking

During the construction of Phase 1, the site will accommodate approximately 200 construction staff. Once Phase 2 construction commences, staffing levels are expected to increase by an additional 50 personnel, bringing the total number of construction staff on-site to 250 during the peak overlapping period.

For staff car parking, it is proposed that temporary car parking will be provided within the site for contractor's vehicles to accommodate these workers during the construction phase. On-site parking will ensure no construction parking occur on public roads.

2.4.1.3 Construction Schedule

The construction of the proposed Gas Turbine Power Generation Station at Kilshane is planned to commence in the first quarter of 2027 and is expected to be completed by the third quarter of 2029, spanning approximately 30 months. The development is anticipated to become operational in the fourth quarter of 2029.

The construction of the permitted Phase 1 development is expected to occur from 2025 to 2028. Therefore, the construction of the Proposed Development is expected to overlap with the construction of Phase 1 from the first quarter of 2027 until 2028.

2.4.1.4 Roads, Services and Landscaping

During construction, the construction traffic will primarily access and egress the site via a new roundabout connecting to an internal road established for the Permitted Development. Two primary haul routes to the N2 have been identified: Haul Route 1 is the shortest at 1.2 km but has pinch points and congestion near Kilshane Cross Junction, while Haul Route 2 is longer (approximately 12 km) but features wider roads with fewer pinch points and better connectivity to both north and south directions on the N2. A temporary 7m-wide access road within the site will be used for construction vehicles, and parking spaces for construction staff will be provided onsite to prevent impact on surrounding areas, with off-site parking arranged by the main contractor as needed.

Traffic management during construction will be in accordance with the Preliminary Construction Traffic Management Plan (CTMP) prepared by Waterman Moylan and included with this application.

The Main Contractor will identify and tag all existing services and utilities around and through the site before works commence, coordinating with relevant technical divisions and utility companies to avoid disruption.

Hoarding lines and fencing will be installed to secure the site perimeter and separate construction activities from water bodies and existing ditches.

Landscaping plans have been optimized to incorporate all cut materials back into the site for final reinstatement and regrading, minimizing soil removal and ensuring environmental protection during earthworks. The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 63,856 m^3 of material (comprising 10,200 m^3 of topsoil and 53,656 m^3 of other material) will need to be excavated. All excavated materials will be stored on-site for reuse in landscaping and reinstatement works, with surplus soils managed according to the Resource and Waste Management Plan (RWMP) included as Appendix 15.1 of Chapter 15 of this EIA Report.

Additionally, exclusion zones have been identified by the project arborist and tree protection measures will be implemented during the entire duration of the construction works.

The effect of the Proposed Development on landscape is assessed in Chapter 11 Landscape and Visual Impact and considers the proposed landscaping design.

2.4.1.5 Material Sourcing, Transportation and Storage

Key materials will include steel, other metals, concrete, piping, electrical cabling, and process equipment.

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

Aggregate materials such as sands and gravels will be stored in clearly marked designated receptacles/areas within a secure area in the construction compound to prevent contamination.

Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

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. Heavy construction vehicle activities will be limited to operating hours of 07:00 to 19:00 Monday to Saturdays inclusive, no work will take place Sundays or public holidays.

2.4.1.6 Waste Management

During the construction phase, typical construction waste materials will be generated which will be source segregated on-site into appropriate skips/containers, within designated waste storage areas and removed from site by suitably permitted waste hauliers as required, to authorised waste facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained.

Waste management will be overseen by the main contractor, who will appoint a construction phase Resource Manager 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 on site.

A Resource and Waste Management Plan (RWMP) has been prepared which provides an effective strategy for managing all construction phase waste arising from the Proposed Development. The RWMP is included as Appendix 15.1 of Chapter 15 of this EIA Report.

2.4.1.7 Noise, Vibration and Dust Nuisance Prevention

With regard to construction activities, reference will be made to BS 5228 (i.e. BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014) *Code of practice for noise and vibration control on construction and open sites*, which offers detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation and noise control measures have been considered, and will be implemented during the construction of the Proposed Development as outlined in the CEMP and CTMP produced by Waterman Moylan and Chapter 10 Noise, such as:

- Noise generation should be minimised at all times especially at night and weekends.
- Noise constraints should be considered when planning and scheduling construction activities.
- Best practicable means identified in BS 5228 should be followed such as:
  - Selection of Quiet Plant
  - Control of Noise Sources
  - Screening
  - Hours of work
  - Liaison with the Public
  - Noise Monitoring
  - Vibration Monitoring
- The contractors shall implement a construction noise monitoring programme.

Noise and vibration control measures are discussed in detail in Chapter 10 Noise and Vibration.

The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the

wind can carry the dust to these locations. The majority of dust produced will be deposited close to the generated source.

As outlined in the CEMP, CTMP, and Chapter 8 Air Quality, in order to prevent or diminish the occurs of dust nuisance, a series of measures will be implemented included, but will not be limited to:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only apart from the contractor's car park which will be hard-core only.
- Furthermore, any road that has potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles using site roads will have their speed restricted and this will be enforced rigidly. On any unsurfaced site road, this will be 20kph and on hard surfaced roads as site management dictates.
- Vehicles delivering material with dust potential (soil, aggregates) will always be enclosed or covered with tarpaulin to restrict the escape of dust.
- Wheel washing facilities will be provided for vehicle exiting site to ensure that mud and other wastes are not tracked onto public roads.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned, as necessary.
- Material handling systems and stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

Dust nuisance control measures are discussed in further detail in Chapter 8 (Air Quality).

2.4.1.8 Water Discharges

Welfare facilities will be provided for the contractor's compound, including portable sanitary facilities, canteens and offices.

Water will also be required for dust suppression, concreting or other construction activities. A potable water supply will be provided via connection for the Permitted Development on the Kilshane site.

Any surface water run-off will be adequately contained and treated prior to infiltrating to ground. See Chapter 6 Hydrology for a full description of mitigation measures proposed.

2.4.1.9 Construction Impacts

Each of the following EIA Report chapters (Chapters 4-15) includes an assessment of the potential impact of construction works on their individual environmental aspect and set out the relevant mitigation measures relating to that aspect.

A Construction Environmental Management Plan (CEMP) and Construction Traffic Management Plan (CTMP) were prepared by Waterman Moylan and is included with the planning documentation. The CEMP includes the mitigation measures detailed in this EIA Report and will be updated prior to commencement of construction to include any relevant planning conditions. The nominated contractor(s) will be required to implement the CEMP and CTMP to minimise the impact of all aspects of the construction works on the local environment. The CEMP includes an emergency response plan in the event of a spill, leak, fire or other environmental incident related to construction.

The primary potential effects from construction are all short-term and are anticipated to include:

- Potential pollution of surface water bodies and downstream protection areas via surface water.

- Effects in terms of nuisances relating to the air quality of the environs due to dust and other particulate matter generated from excavation works and effects on the noise environment due to plant and equipment involved in construction.
- Effects on the land, soils, geology and hydrogeology of the site during construction i.e. some loss of protection of the underlying aquifer to contaminants during site clearance, levelling and excavations etc.; and
- Effects on the local road network and its environs due to construction workers and other staff attending site during preparation, construction, and commissioning phases

Mitigation measures to address each of these potential short-term effects are presented in each individual EIA Report chapter and in the CEMP and CTMP prepared by Waterman Moylan.

2.4.2 Description of Commissioning

It is anticipated that the construction works for the Proposed Development will take approximately 30 months. The construction phase is expected to commence in Q1 2027, with completion targeted for Q3 2029. Following construction, the development is estimated to be operational by Q4 2029.

2.4.3 Operation of the Project

Once operational, the Proposed Development will provide for additional power generation capacity and will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity is not available. During operational phase, the Proposed Development will follow a detailed Operational Environmental Management Plan (OEMP) that will be submitted to the written agreement of the Planning Authority, in line with the planning conditions imposed for Permitted Development.

The operation will be monitored and maintained by suitably qualified nominated site personnel, ensuring the development operates effectively, efficiently and in accordance with Kilshane procedures and IED Licence requirements.

As mentioned in Section 2.2.2, the development site is governed by an existing Industrial Emissions (IE) Licence from the EPA, reference P1208-01. A licence review will be required to reflect the design changes at the site resulting from the Proposed Development.

2.4.3.1 Staffing

Once operational, the Proposed Development will require an additional 10 workers. Due to the minor staff increase, no additional car parking is proposed as part of this application, as permitted car parking will be sufficient to accommodate the total car parking demand at the Kilshane site.

2.4.3.2 Operational Hours

The proposed turbines are expected to operate intermittently throughout the year, with the expected scenario: Assumes each unit operates for 100 hours per year and conservative/maximum hours scenario: Assumes continuous operation of all units (24/7/365). Its operation will be contingent on dispatch instructions from EirGrid, the Transmission System Operator (TSO), who will determine the specific hours of operation based on real-time system requirements.

The turbines will also require quarterly testing/maintenance and may also operate in an emergency in liquid fuel mode for no more than 500 hours per turbine, per year.

The plant is designed to operate 365 days a year if required, based on the technology and abatement system selected.

2.4.4 Decommissioning of the Project

The lifespan of the Proposed Development is proposed to be 25 years. When closure is required, the Proposed Development and the Permitted Development will follow the Site Closure Plan, including, but not limited to the following measures:

- Decommissioning of equipment will involve disconnecting redundant electrical and telecommunication connections and decommissioning the turbine and associated plant equipment;
- The gas turbine, transformers, servers, and other equipment will be removed and either returned to the supplier, transferred/sold to other companies in Ireland, transferred to recovery/recycling companies or treated as waste depending on the age/condition at the time of closure;
- The remaining material on site will be considered waste, either hazardous or non-hazardous. Removal of both hazardous and non-hazardous waste materials will be removed and disposed of in accordance with the facility's IE Licence requirements and appropriate National and EU Legislation;
- Decontamination and cleaning of plant and equipment where required will be completed and documented; and
- Disconnection of the electrical substation and disconnection of the water supply. Electrical substation and transformers will be rendered safe, and it is assumed that decommissioning will be carried out by maintenance staff.

2.5 SUSTAINABILITY ENERGY EFFICIENCY AND RESOURCE USE

The operation of the installation will involve the consumption of electricity, fuel, and mains water.

It is expected that each turbine will operate an average of 100 hours per year. As a conservative/maximum hours scenario, it is assumed that both units will operate 24/7/365 for 8,760 hours a year.

In terms of fuel oil usage, the expected scenario is 10 hours running per year for fuel changeover tests only and the worst case would be limited to 500 hours per year, in compliance with the IED license for the site.

The estimated quantities to be used when the installation is operational are shown below in Table 2-2 below.

Table 2-2 Summary of the Estimated Future Resource Use at the Installation Resource

Resource	Quantity per annum (Expected)	Quantity per annum (Worst Case)
Electricity (Purchased)	13,002MWh	0MWh
Total Electricity Generated	68,000 MWh	5,956,800 MWh
Total Electricity Exported	66,785 MWh	5,848,024 MWh
Total Natural Gas Used	172,195 MWht	15,084,325 MWht
Total Diesel (Fuel Oil) Used	2,520 tonnes	126,000 tonnes
Water (Public Supply)	400,22.56L	2,507,112L

The applicant will employ a variety of technologies to maximize the efficient use of energy within the installation. The installation will be operated in accordance with an Energy Efficient Management System (EEMS), which will be compliant with them, as well as the requirements of BAT.

2.6 HEALTH AND SAFETY

2.6.1 Design and Construction Health and Safety

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

The Proposed Development has been designed by skilled personnel in accordance with internationally recognized standards, design codes, legislation, good practice and experience.

The activities of the 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

2.6.2 General Operational Health and Safety

The Kilshane Environmental Health and Safety (EHS) team will be responsible for overseeing the monitoring of the operations for compliance with legislative Health and Safety standards when the Proposed Development is completed and operational.

The new facility will adhere to the standard operating procedures (SOPs) that will be in place for permitted operations at the facility as required by legislation. Prior to commencement of operations, the SOPs will be amended and/or new procedures established to take account of the new operations, where applicable.

2.6.3 Fire Management

A system will be provided for detection, alarm, and fire suppression systems to enhance life safety and protection of property by the detection of fire, enabling an audio/visual alarm to be given such that emergency actions may be taken fully compliant with Irish and EU regulations and in accordance with the insurers requirements.

The fire detection and alarm systems will be subject to routine checks by site personnel and will be inspected and tested by the external service provider on a regular basis.

2.7 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The Proposed Development is to be located on zoned lands surrounded by agricultural lands, the Huntstown Quarry, commercial and industrial developments, road network and a few scattered residential dwellings.

During construction, there is the potential for short-term nuisance impacts from traffic, dust, noise and construction waste, if not carefully managed. The Applicant will require contractors to implement the CEMP to minimise each of these potential impacts.

Once operational, the greatest potential for impacts with respect to the Proposed Development are nuisances as result of operational noise and air emissions. It is anticipated that Proposed Development operations will not have significant effect on traffic and waste production and will generate limited changes to other environmental factors.

Chapters 3 to 16 of this EIA Report assess the potential impact of the construction and operation of the Proposed Development on the receiving environment. Please refer to each specialist chapter respectively.

2.8 MAJOR ACCIDENTS/DISASTERS

The 2014 EIA Directive and associated EPA EIA Report Guidelines 2022 requires that the vulnerability of the project to major accidents, and natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity and volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the site has also been considered with reference to Seveso/COMAH in Section 1.7.4 of Chapter 1 (Introduction).

2.8.1 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 details are provided in Chapter 5 Land, Soils and Geology.

2.8.2 Flooding/Sea Level Rise

The potential risk of flooding on the site was also assessed. A Flood Risk Assessment (FRA) was carried out by Waterman Moylan for the Proposed Development site as part of this EIAR and is included as Appendix 6.2 of Chapter 6.

The Proposed Development includes the implementation of SuDS and an attenuation system that have been designed with an allowance 20% increase in flows due to climate change as suggested per 2009 Guidelines.

According to the FRA, the residual risk for all flood sources considered (tidal, fluvial, pluvial, ground water and human/mechanical error) are deemed 'extremely low' to 'low'. Furthermore, the Proposed Development design has no potential impact on flood risk for the overall Kilshane site and other neighbouring properties. Further detail is provided in Chapter 6 (Hydrogeology and Hydrology).

2.8.3 Minor Accidents/Leaks

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the risk of a minor/accident is low and the residual effect on the environment is expected to be imperceptible given the implementation of the mitigation measures set out in Chapters 6 (Lands, Soils and Geology) and 7 (Hydrogeology and Hydrology).

2.9 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

Article 3(1) of the EIA Directive 2011/92/EU as revised by Directive 2014/52/EU, provides that the EIA shall identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of a project on specified factors listed (a)-(d), and the interaction between those factors. Article 5(1)(f) provides that the developer shall prepare and submit an EIA report which shall include at least the information listed (a)-(e) of Article 5(1), and *"any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."*

Annex IV lists the information to be contained in an EIAR, including at point 5(e), a description of the likely significant effects of the project on the environment resulting from, *inter alia*, the cumulation of effects with other existing and / or approved plans and projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at EU or Member State level which are relevant to the project.

Related to this, Annex IV point 6 requires that the EIAR includes a description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

These requirements of the EIA Directive are transposed by Part X of the Planning and Development Act 2000, as amended (the "Planning Act") and Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (the "Planning Regulations").

Relevant Guidance has also been considered including in particular:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (EC Guidance, 2017); and
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA Guidance, 2022).

The Environmental Protection Agency (EPA) (2022) defines cumulative effects as *"the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects."* This includes the impact of other relevant projects, plans and activities that were not present at the time of baseline data collection or survey.

Against this law and policy backdrop, a Cumulative Effects Assessment (CEA) has therefore been undertaken as part of the EIA to ensure that any additive impacts arising from other developments are fully assessed, as well as interactions between the relevant environmental factors, as required under the EIA Directive. The relevant cumulative projects (including the rationale for their selection) are identified here within Chapter 2, and the assessment of the effect of the Proposed Development in cumulation with these cumulative projects is provided in the relevant specialist chapters within this EIAR.

2.9.1 Cumulative Receiving Environment Effects

An appropriate Zone of Influence (ZoI) has been identified below (Section 2.9.2.2 and Section 2.9.2.3) on the basis of a clear methodology set out below and within it, three categories of development have been taken into consideration:

Receiving Environment

Projects that are built and operational at the time that survey data have been collected have been classified as part of the baseline conditions within the EIAR.

However, consideration of the relevant application materials, including but not limited to the EIAR, have been reviewed to ensure no additional phases of work are proposed. Where there is the potential for further change in the baseline conditions from another project or where there is uncertainty, then the other project has been included in the CEA also.

Permitted Project of Potential Relevance

This includes:

- Permitted but not Constructed Projects:
  - Those projects that are only partially constructed or construction has not started at the time that baseline characterisation is undertaken;
  - Those that were only recently completed, during the development of the baseline characterisation, the full extent of the impacts arising from the development(s) may not be reflected in the baseline; and/or
  - Those projects which may have consent or licences to undertake further work, such as maintenance dredging or notable maintenance works which may arise in additional effects.
- Permitted but not yet Operational Projects.

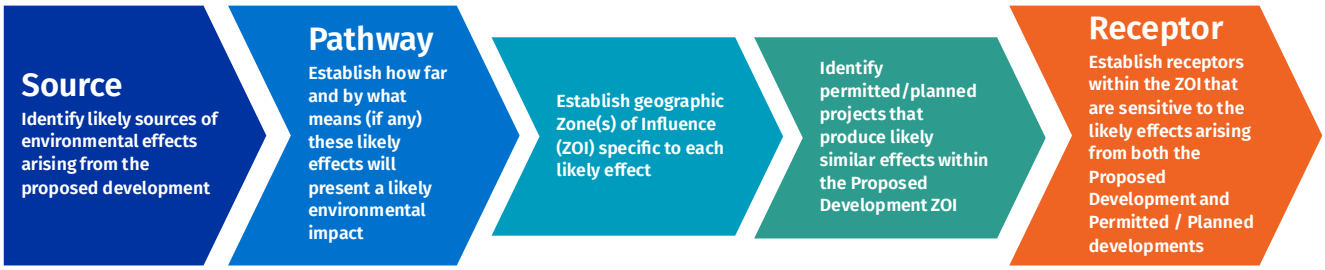
Likely Future Development with similar effects within the Zone of Influence

This includes developments in the planning system and development indicated in a Masterplan or zoning. The relevance of such development is determined in accordance with the methodology detailed immediately below (Section 2.9.2).

2.9.2 Identification of Cumulative Project Methodology

2.9.2.1 Source Pathway Receptor Model

Figure 2 Source Pathway Receptor Model



Each specialist chapter of this EIAR has taken account of permitted and likely future developments with similar effects and whose construction phase and / or operational phase may overlap with the construction and / or operational phase of the Proposed Development.

The identification of those projects with the potential to act in cumulation with the Proposed Development is facilitated via the Source-Pathway-Receptor (SPR) model which is a multi-step process (Figure 2). The SPR tool is the most cautious means of assessment which ensures that all possible cumulative effects are identified at a very early stage thus enabling further studies, mitigation measures or ameliorative actions to be put in place. The inherent use of the precautionary principle within the SPR methodology means that cumulative effects arising from permitted / likely future projects can be identified at a preliminary stage without any need for detailed studies, but rather upon available desktop information.

The geographical area within which such projects are deemed to be potentially relevant (Zone of Influence) is identified based on the methodology described below (Section 2.9.2.2).

2.9.2.2 Identification of Zone of Influence (ZOI)

A ZOI is the furthest geographical extent that a particular effect from the Proposed Development could extend. A ZOI is unique to each development and the environment with which it interacts.

For most developments there are many potential ZOIs of different shape and size, each one specific to the identified potential effect during both the construction and the operational phase; for example, a water-borne pollutant may result in a long linear ZOI, while an air-borne pollutant may result in a more circular ZOI much closer to the development. It is also possible for developments that there can be many

different water-borne ZOIs dependent upon many different variables such as type of pollutant, time and means of release, the interaction of that pollutant with the water column and the hydrological regime at the time of release.

It is the geographical extent of the ZOI specific to the Proposed Development that establishes what permitted projects have the potential to act cumulatively with the Proposed Development and whether there is a complete SPR link.

In considering the characteristics of the Proposed Development, and assessments conducted in this EIAR, the likely outward emissions that could give rise to a ZOI beyond the development boundary are:

- Noise generation during construction
- Dust generation during construction
- Noise generation from the operation of the turbines
- Nitrogen Oxides (NOx), Carbon Monoxide (CO), Sulphur Dioxide (SO2) and particulate matter (as PM10 and PM2.5) emissions from the operation of the turbines

With regard to noise during construction and operation of the Proposed Development, while maintaining the noise criteria 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* it is anticipated that for the noise generated by construction equipment on site will have no significant impact beyond the study area of 100 m radius from the site..

In terms of construction dust, based on the Institute of Air Quality Management (IAQM) document '*Guidance on the Assessment of Dust from Demolition and Construction* (version 2.2)', 2024 this tends to be deposited within 250 m radius of construction sites, with the majority of the deposition occurring within the first 50 m radius. 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.

As detailed in Chapter 10 - Noise and Vibration, the maximum ZOI that has been identified for outward noise emissions from the operational phase of the Proposed Development is 400m.

Also, as detailed in Chapter 8 – Air Quality, the highest concentrations of nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO2) and particulate matter (as PM10 and PM2.5) associated with the Proposed Development occur within approximately 2 km of the development boundary, which represent the ZoI for human health effects. While the highest concentrations of nitrogen oxides (NOx), sulphur dioxide (SO2), nitrogen deposition and acid deposition associated with the Proposed Development occur within approximately 15 km of the development boundary, which represent the ZoI for ecological effects.

Taking the above into account it can be stated that the ZOI for the Proposed Development in terms of outward emissions during the construction phase is a maximum 250 m radius of the Site Boundary, and for operational phase is a maximum radius of 15km from the Site Boundary.

2.9.2.3 Geographical Extent of Projects with Potential for Cumulative Effects

Each environmental factor applies the Zone of Influence (ZOI) most relevant to its assessment, which may vary from chapter to chapter and includes its own cumulative considerations. In general, the closer other developments are to the Proposed Development, the greater the likelihood of significant cumulative impacts.

For this assessment, developments with the highest potential for significant cumulative effects are considered to be those located within a 500 m radius of the Proposed Development. Accordingly, the construction and operational phases of permitted projects have been assessed within a **1 km** radius of the site, comprising 500 m for the Proposed Development itself and an additional 500 m to capture any overlapping permitted or reasonably foreseeable future projects.

2.9.2.4 Potential Permitted / Likely Future Projects of Relevance

Having established that the geographical area of inquiry is 1 km, the final step is to determine any new or proposed projects within that area that may be producing construction related noise and air emissions during the same construction period as the Proposed Development or producing operational noise and air emissions during the operational phase of the Proposed Development.

Not all development within this geographical area is capable of combining with the Proposed Development to result in potential cumulative effects. When assessing the Proposed Development cumulatively it is only development that is likely to give rise to a similar or interactive effects as the Proposed Development upon a receptor that have the potential to act cumulatively with the Proposed Development.

In order for a potential cumulative effect to arise, all three elements of the SPR linkage need to be present. For example, if there is no pathway or functional link (direct or indirect) between an activity and a receptor, there is no potential for effect. Additionally, if there is no receptor[2] within the area of a potential pathway, there is similarly no effect as it does not cause harm to the environment due to the lack of a receptor.

The identification of development of relevance within the geographical area with the potential to give rise to cumulative effects has been achieved on the basis of a two-fold approach:

- Firstly, a comprehensive search was undertaken to identify all developments within 1 km of the Proposed Development site.
- Subsequently, a review of the magnitude, size, scale, location and current status of these developments is undertaken to assess their potential to contribute to significant cumulative effects with the Proposed Development.

The initial stage of this process for permitted projects is facilitated through the utilisation of planning search tools listed below to identify permitted planning applications within 1 km of the Proposed Development whose expiry date had still not expired by 29th April 2026, being the time of this assessment. These same planning search tools are also used to identify likely future projects that are still in the planning system. Consultation with zoning maps and, where relevant, development agencies is used to identify any remaining likely future projects. This is considered to be an overcautious approach in particular with regard to construction effects, given that this approach may identify permitted developments whose construction period will in fact be complete prior to the construction period for the Proposed Development. A combination of the following online mapping tools, publications and consultations in identifying all permitted/likely future projects of potential relevance was used for this search:

- The Department of Housing, Local Government and Heritage EIA Portal[3];
- An Bord Pleanála Map Search[4];
- My Plan National Planning Application Map Viewer[5]; and

The secondary stage is conducted in alignment with the 2022 guidance from the EPA[6], which underscores the necessity to focus on effects that are either inherently significant or possess the potential for significance. This comprehensive review has been undertaken in order to identify the full range of local development with the potential to give rise to likely significant cumulative effects when considered in

[2] Receptors are features of the environment that are subject to assessment under Article 3 of the EIA Directive (2011/92/EU as amended by 2014/52/EU), namely population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape.
[3]https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1
[4] https://www.pleanala.ie/en-ie/Map-search
[5] https://www.myplan.ie/national-planning-application-map-viewer/
[6] EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports, EPA

association with the Proposed Development. This approach permits an assessment of the extent to which these future undertakings might interact with the Proposed Development and allows for the exclusion of insignificant or non-relevant developments from any further consideration.

The relevant projects identified with potential for cumulative effects are presented in Section 2.10 under the following sub-headings:

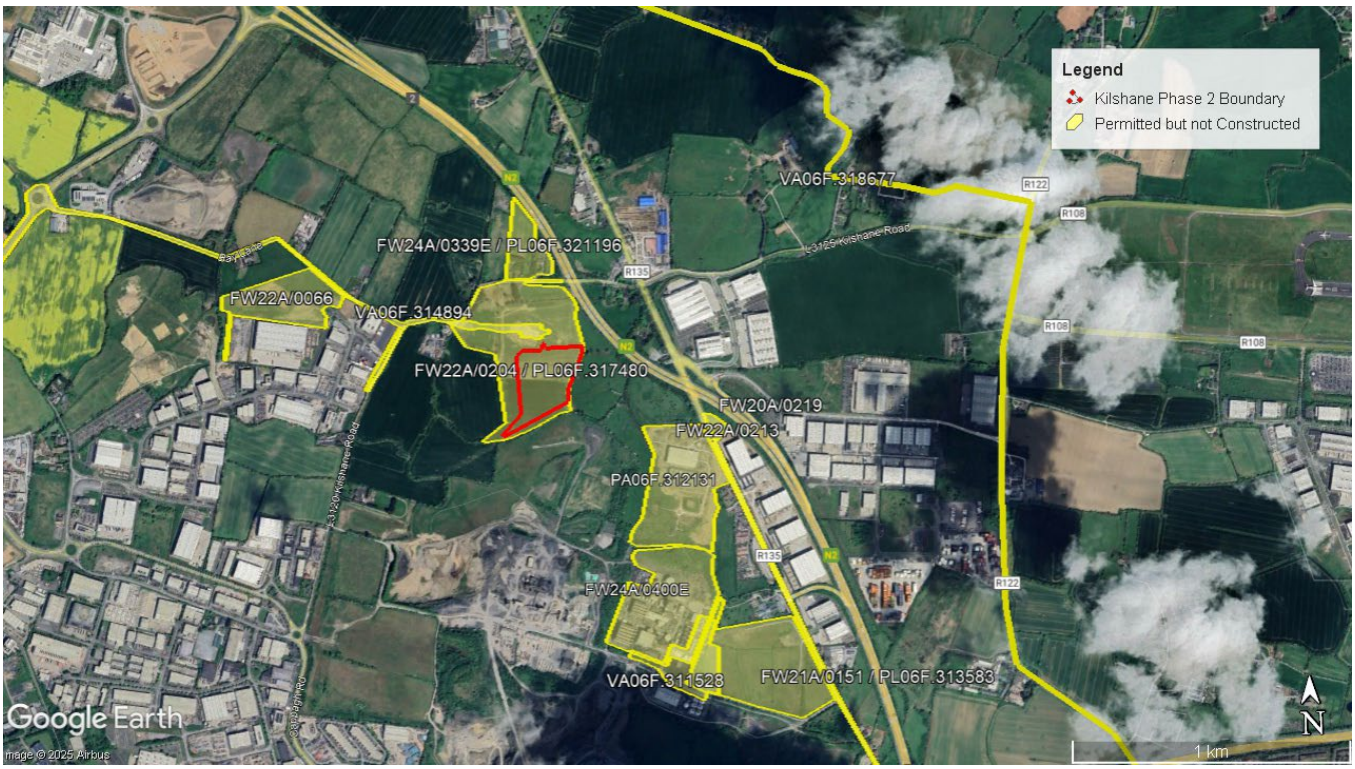
- Constructed but not operational
- Permitted but not constructed
- In the planning system
- Known Future Developments not in the Planning System within the Zone of Influence
- Future Development of the Remainder of the Study Area

Appendix 2.1 provides details of permitted/likely future developments that have been professionally assessed as not relevant to this EIAR. Section 2.10.1.1 documents projects which have been professionally assessed to be of potential relevance to the assessment of this Proposed Development and are considered by each relevant specialist chapter in the EIAR.

2.10 Description of Related Projects

2.10.1 Relevant Projects Identified with Potential for Cumulative Effects

Figure 3 Relevant Permitted/Submitted Development



2.10.1.1 Constructed but not Operational

Based on the planning search done in support of this application, no relevant 'Constructed but not Operational' projects with potential for cumulative effects were identified.

2.10.1.2 Permitted but not Constructed

PA06F.312131 - Townlands of Clonshagh, Dubber and Newtown, County Fingal and Dublin City

Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility. The development will include a Regional WwTP of 500,000 PE on 29.8 ha site in Clonshaugh to be constructed in a single phase; 11.3 km length outfall pipe from WwTP to outfall point approximately 1 km north-east of Ireland Eye (5.4 km land-based, 5.9 km marine section); among others. This planning application was accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS).

- Granted: 09 July 2025
- Expiry Date: 09 July 2035
- Status: Not yet constructed

FW24A/0400E - Huntstown Power Station, In the townlands of Hunstown and Johnstown, Co.Dublin, D11N407.

Permission for A Battery Energy Storage System facility to include up to 85 no. containerised battery storage modules on concrete bases, 20 no. transformer and power conditioning units, cable racks, and associated lighting. Associated development including internal access roads, security gates, palisade perimeter security fencing, acoustic barrier, site drainage and all other works required to facilitate the development. This planning application was accompanied by a Planning and Environmental Considerations Report (PECR) including a construction dust and noise assessments, an Appropriate Assessment Screening, and a CEMP including a Construction Traffic Management Plan and a Surface Water Management Plan, and a Resource and Waste Management Plan.

- Granted: 01 July 2025
- Expiry Date: Not available
- Status: Not yet constructed

FW24A/0339E / PL06F.321196 - Bloomburn Cottage, Kilshane, Dublin 11, D11 F1WB., and Kilmonan Lodge, Kilshane, Dublin 11, D11XP89.

The demolition of two no. existing detached dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89) and associated garages and shed structures, and permission for the use of the subject site (c. 2.52 Ha) as a storage container depot with a maximum capacity of c. 1,270 no. containers in 9 no. blocks ranging in height between 3 no. and 6 no. containers high, with 2 no. 8.7 mt. high reefer gantries, construction of ancillary single storey detached office and workshop building (c. 363 m^2 GFA), construction of single storey detached prefabricated security hut (c. 9.5 m^2 GFA), provision of 9 no. car parking spaces including 1 no. disabled persons car parking space and 1 no. electric vehicle charging space, 2 no. motorcycle parking spaces, 6 no. bicycle spaces and bicycle shelter and provision of 8 no. truck parking spaces, new onsite wastewater treatment system and percolation area, among others. This planning application was accompanied by a Landscape Plan. Condition no. 5 and no. 6 of the planning grant states that prior to commencement of development a Resource Waste Management Plan and a Construction Management Plan (CMP) shall be prepared and agreed with the planning authority. Condition no. 8 states that a site suitability assessment for the proposed on-site wastewater treatment system shall be carried out. Condition no.9 state that prior to commencement of development, the developer shall submit and get in agreement with the planning authority on the details for the disposal of the surface water.

- Granted: 23 April 2025
- Expiry Date: 23 April 2025 for both construction and operations.
- Status: Not yet constructed

FW21A/0151 / PL06F.313583 - Lands adjacent to Huntstown Power Station, North Road, Finglas, Dublin 11.

Demolition of 2 no. existing residential dwellings and ancillary structures to the east of the site (c.344qm total floor area); Construction of 2 no. data hall buildings (Buildings A and B) comprising data hall rooms, mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, outdoor staff areas, loading bays and docks, associated plant throughout, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout; External plant and 58 no. emergency generators located within a generator yard to the east and west of Buildings A and B at ground level. The area is enclosed by a c.6.5m high louvred screen wall; Among others. This planning application was accompanied by an Environmental Impact Assessment Report (EIAR) and an Appropriate Assessment Screening Report.

- Granted: 21 March 2025
- Expiry Date: 21 March 2035
- Status: Not yet constructed

VA06F.311528 - Lands adjacent to Huntstown Power Station, North Road, Finglas, Dublin 11.

The development comprises a two-storey 220kV gas insulated switchgear (GIS) substation to be known as 'Mooretown' with a total gross floor area of 2,068m^2 and overall height of 17m – 20m, 5 no. 20kV switchgear buildings, a series coil and 1 no. 20kV control room building, underground cabling and all associated and ancillary site works. This planning application was accompanied by an Environmental Impact Assessment Report (EIAR) and an Appropriate Assessment Screening Report.

- Granted: 21 March 2025
- Expiry Date: 21 March 2035
- Status: Not yet constructed

VA06F.318677 - Within the townlands of Fieldstown, Clonmethan Electoral District, Co.Dublin.

The development comprises a SID application for a 110kV Air Insulated Switchgear (AIS) tail-fed substation compound, combined with a 13.3km 110kV underground cable connection to Finglas 220kV Substation. The development will also include all access and associated infrastructure. This planning application was accompanied by an Environmental Impact Assessment Screening (EIA) Report and an Appropriate Assessment Screening Report.

- Granted: 29 January 2025
- Expiry Date: 29 January 2035
- Status: Not yet constructed

FW22A/0204 / PL06F.317480 - Kilshane Road, Kilshane, Finglas, Dublin 11 (within Proposed Development site boundary).

This development is referent to Permitted Development, Kilshane Phase 1, and comprises the construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts; The demolition of a detached residential dwelling (c. 142 m^2 GFA) and associated farm buildings (c. 427 m^2 GFA) located in the north west corner of the subject site; The construction of entrance gates, low wall and railings fronting the realigned Kilshane Road and a private internal road network providing for vehicular, cyclist and pedestrian access to serve the development; Total provision of 26 no. car parking spaces; Among others. This planning application was accompanied by an Environmental Impact Assessment Report (EIAR), an Appropriate Assessment Screening Report, a COMAH Assessment, an Assessment of Major Accidents, a Flood Risk Assessment, Archaeological Test Excavation Report, a Preliminary Construction

Environmental Management Plan, and a Preliminary Construction, Demolition and Waste Management Plan.

- Granted: 16 May 2024
- Expiry Date: operational lifespan of 25 years
- Status: Not yet constructed

VA06F.314894 - Lands at Kilshane Road, Kilshane, Finglas, Dublin 11 (within Proposed Development site boundary).

Proposed development of a 220kV Gas Insulated Switchgear (GIS) substation on lands at Kilshane Road, and an underground 220kV transmission line connection to the existing Cruiserath 220kV substation. This planning application was accompanied by an Environmental Report and Appropriate Assessment Screening Report. Condition 8 of the planning grant states that prior to commencement of development, a detailed Construction Environmental Management Plan (CEMP) for the construction phase shall be submitted to and agreed in writing with the planning authority. Condition 9 states that the developer shall facilitate the archaeological appraisal of the site. Condition 13 outlines the noise limit levels the development will have to comply when operational.

- Granted: 24 August 2023
- Expiry Date: 24 August 2033
- Status: Not yet constructed

Planning permission VA06F.314894 has been subsequently altered by ACP-323812-25 on the 27th of March 2026 under Section 146B of the Planning Development Act 2000. The alterations to the original permission included the slight relocation of the previously permitted GIS compound (approximately 10 m to the north and 3 m to the west), reduction in floor area of approximately 799m^2, the alteration to the permitted 220kV underground transmission line route within and directly adjacent to the altered substation compound, and the removal of two previously permitted car parking spaces.

FW22A/0213 - Newtown & Coldwinters, North Road, Fingal, Co. Dublin.

The development is within a total site area of up to c. 1 ha. to include 1 no. DSO (Distribution System Operator) electrical substation building. 1 no. customer switchgear, electrical inverter / transformer station modules. 40 no. containerised battery storage units on concrete support structures, heating, ventilation and air conditioning units (HVAC units), access tracks and upgraded site entrance, underground cabling route c. 1.45 km to existing ESB 220kV Finglas Electricity Substation, associated electrical cabling and ducting, security gates, palisade perimeter security fencing, CCTV security monitoring system and landscaping works and all associated ancillary site infrastructure. This planning application was accompanied by an Environmental Impact Assessment (EIA) Screening Report, an Appropriate Assessment Screening Report, Environmental and Planning Report, Noise Impact Assessment and a Flood Risk Assessment.

- Granted: 28 February 2023
- Expiry Date: 28 February 2033
- Status: Not yet constructed

FW22A/0066 - A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15.

The proposed development consists of the construction of a high technology manufacturing unit (for the manufacturing of high technology electrical components), with a total gross floor area (GFA) of 23,6000 sq.m (including ancillary office space of 2,318 sq.m. at ground and first floor levels), and with a main parapet height of c. 12 metres and maximum height of 14.5 metres; Provision of a link corridor between the proposed high technology manufacturing unit and Unit 900 to the south (logistics/warehouse unit

permitted under Reg. Ref. FW21A/0146); rooftop plant for the proposed unit, an ESB substation with switchroom, 2 no. emergency generators, 2 no. sprinkler/water tanks and 2 no. pumphouses, among others. This planning application was accompanied by an Environmental Impact Assessment Report (EIAR), Appropriate Assessment Screening Report, Flood Risk Assessment, Construction and Demolition Waste Management Plan and an Outline Construction Management Plan.

- Granted: 07 July 2022
- Expiry Date: 7 July 2027
- Status: Not yet constructed

The Permitted Development has been subsequently amended in April 2026 by Planning Application Reg. Ref. FW25A/0523E, including changes to some of the permitted elements such as the administration building, the power island layout, changes to the fuel storage tank with an increase in the fuel storage capacity from 6,246 m³ to 27,430 m³, among others.

FW20A/0219 - Newtown and Coldwinters, North Road, Co. Fingal.

Permission for an amendment to the original planning permission, at this site, for a gas peaking facility with 10 no. containerised gas fired generating units, with an export capacity of 20 megawatts (MV) under planning reference FW19A/0090. Amendments are proposed to the gas peaking will consist of the installation of 6 no. battery storage units with an export electricity capacity of 10-15 MV and 4 no. containerised gas fired generating units with an export electricity capacity of 10 MV, in replacement for the 10 no. containerised gas fired generating units, granted under planning reference FW19A/0090. 3 no. inverter transformers will also be added to the site, being the battery storage units. Other elements of the development will remain the same as FW19A/0090 and include an underground cabling route c 1.45km along the R135 road, among others. This planning application was accompanied by a Landscape Plan. Condition no.7 of the planning grant states binding operational hours for the use of heavy construction machinery and general construction activities. Condition 8 states that the development shall be so operated that there will be no emissions of malodours, gas, dust, fumes or other deleterious materials, no noise vibration on site as would give reasonable cause for annoyance to any person in any residence, adjoining unit or public place in the vicinity. Condition 8 states that no surface water / rainwater is to discharge into the foul water system under any circumstances, the surface water drainage must be in compliance with the 'Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0, FCC, April 2006 and that Stormwater shall not discharge onto the public road.

- Granted: 07 Apr 2021
- Expiry Date: Not available
- Status: Not yet constructed

Table 2-3 outlines the estimated construction timelines for Proposed development and the identified Permitted but not Constructed developments with potential for cumulative impacts.

Table 2-3 Construction Timelines for Proposed Development and Permitted but Not Constructed Developments with Potential for Cumulative Impacts

Development	Original Estimated Start	Original Estimated End	Approximate Construction Duration (months)
Kilshane Phase 2 (Proposed Development)	Q1 2027	Q3 2029	33 months
PA06F.312131	Q4 2021	Q4 2025	42 months

Development	Original Estimated Start	Original Estimated End	Approximate Construction Duration (months)
	(Planning Grant only received on the 09/07/2025 – original timelines have been affected)	(Planning Grant only received on the 09/07/2025 – original timelines have been affected)	
FW24A/0400E	Q1/ Q2 2026	Q3 2027/ Q3 2028	15-27 months
FW24A/0339E / PL06F.321196	Information not available	Information not available	Information not available
FW21A/0151 / PL06F.313583	Q3 2021 (Planning Grant only received on the 21/3/2025 – original timelines have been affected)	Q3 2026 (Planning Grant only received on the 21/3/2025 – original timelines have been affected)	54 months
VA06F.311528	Q1/Q2 2022 (Planning Grant only received on the 21/3/2025 – original timelines have been affected)	Q1/Q2 2024 (Planning Grant only received on the 21/3/2025 – original timelines have been affected)	24 months
VA06F.318677	Q4 of 2024 (Planning Grant only received on the 29/01/2025 – original timelines have been affected)	Q4 of 2026 (Planning Grant only received on the 29/01/2025 – original timelines have been affected)	24 months
FW22A/0204 / PL06F.317480 - Kilshane Phase 1	Q4 2025	Q1 2028	30 months
VA06F.314894	Information not available	Information not available	Information not available
FW22A/0213	Information not available	Information not available	4/6 months
FW22A/0066	Q3 2022 (As of 06/10/25, construction works have not commenced – original timelines have been affected)	Q3 2023 (As of 06/10/25, construction works have not commenced – original timelines have been affected)	9-11 months
FW20A/0219	Information not available	Information not available	4-6 months

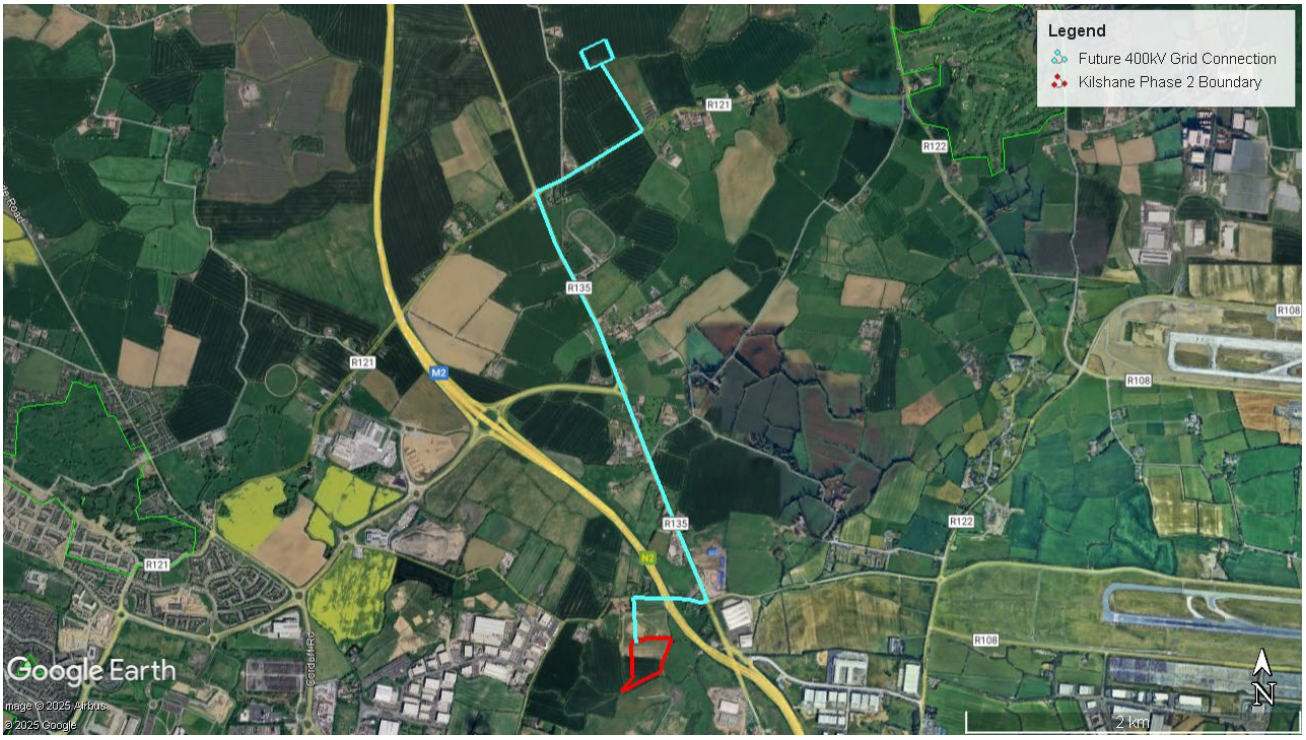
2.10.1.3 In the Planning System

At the time of this data search (29th April 2026) there are no relevant applications within the ZOI in the planning system.

2.10.1.4 Known Future Developments not in the Planning System within the Zone of Influence

The 2 no. additional turbines proposed as part of the Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that the applicant will submit an application for a new gridline in due course. While the exact route and design details have yet to be finalised, a preliminary alignment is illustrated in Figure 4 below. The final routing and development characteristics will be confirmed at a later stage. This application will be accompanied by an Environmental Impact Assessment Report (EIAR).

Figure 4 Future 400kV Grid Connection



2.10.1.5 Future Development of the Remainder of the Study Area

The subject lands and the lands within the ZOI provide good potential for delivering heavy industry, enterprise and employment use. The Proposed Development represents one of many opportunities that have been and are being constructed to realise this potential.

Any future application on these lands will be subject to planning approval and environmental assessment as required. Any new development proposed on these lands would be accompanied by an EIA, or EIA Screening as required and would take into consideration the development of this Proposed Development.

The Proposed Development lies within lands of which is zoned under the *Fingal Development Plan 2023 – 2029 (FDP)* for 'HI - Heavy Industry' which seeks to:

"Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."

As per Table shown in page 484 of the FDP, the development that is 'Permitted in Principle' within 'HI - Heavy Industry' lands are as follows:

- Abattoir; Concrete/Asphalt; Fuel Depot/Fuel Storage; Heavy Vehicle Park; Industry – Extractive / Quarrying; Industry – High Impact; Office Ancillary to Permitted Use; Open Space; Plant Storage; Restaurant/Café; Retail – Local < 150 sqm nfa; Sustainable Energy Installation; Telecommunications Structures; **Utility Installations**; Waste Disposal and Recovery Facility (High Impact).

The Proposed Development comprises the expansion of an existing, already permitted Energy Centre and is therefore **permitted in principle** under the 'Utility Installations' category of the *Fingal Development Plan 2023–2029*.

Other zoning within the ZOI include:

- 'GE - General Employment' with the developments that are 'Permitted in Principle' in page 480 of the FDP: Builders Provider/Yard; Civic Waste Facility; Enterprise Centre; Food, Drink and Flower Preparation/Processing; Fuel Depot/Fuel Storage; High Technology Manufacturing; Industry – General; Industry – Light; Logistics; Office Ancillary to Permitted Use; Open Space; Petrol Station; Research and Development; Restaurant/Café; Retail – Local < 150 sqm nfa; Road Transport Depot; Sustainable Energy Installation; Telecommunications Structures; Training Centre; Utility Installations; Vehicle Sales Outlet – Small Vehicles; Vehicle Sales Outlet – Large Vehicles; Vehicle Servicing/ Maintenance Garage; Warehousing; Waste Disposal and Recovery Facility (Excluding High Impact) ; Wholesale.
- 'WD - Warehousing and Distribution' with the developments that are 'Permitted in Principle' in page 516 of the FDP: Cargo Yards; Fuel Depot/Fuel Storage; Heavy Vehicle Park; Logistics; Office Ancillary to Permitted Use; Open Space; Plant Storage; Restaurant/Café; Retail – Local < 150 sqm nfa; Road Transport Depot; Sustainable Energy Installation; Telecommunications Structures; Utility Installations; Vehicle Servicing/ Maintenance Garage; Warehousing; Wholesale.
- 'GB - Green Belt' with the objective of: Create a rural/urban Greenbelt zone that permanently demarcates the boundary (i) between the rural and urban areas, or (ii) between urban and urban areas.

Chapter 3 – Alternatives

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3. ALTERNATIVES

3.1 Introduction

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), and in Schedule 6 of the Planning and Development Regulations, 2001, as amended ("the Regulations"), which states:

> *A description of the **reasonable alternatives** studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.*

Schedule 6(2)(b) of the Regulations elaborates on 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 EPA's *Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)* – states:

> *The presentation and consideration of the various reasonable alternatives investigated by the developer is an important requirement of the EIA process.*
>
> *The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*

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 chapter 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 chapter assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale, and project design and processes of the Proposed Development. This chapter 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

There is an established statement of need for the Proposed Development in Ireland within National, regional and local strategic planning contexts. New fast starting peaking conventional capacity is needed in the state to support a transition to a renewables-based grid, as renewable energy sources such as wind are inherently variable. Targets and objectives for delivery of flexible gas-fired generation are included in the *Policy Statement of Security of Electricity Supply (2021)*, *Energy Security Package to 2030 (2023)*, and the annual *Climate Action Plans (Climate and Low Carbon Development Act, (2021))*. These objectives are supported through national- and local-level planning frameworks, in the *National Planning Framework 2040 (First Revision, 2025)* and the *Fingal County Development Plan 2022-2028*.

3.2.1 Relevant Policy

Policy Statement on Security of Electricity Supply (2021)

The rationale for new flexible gas-fired generation is described in the *Policy Statement on Security of Electricity Supply* (Department of Climate, Energy, and the Environment, 2021), which sets out policy statements to ensure security of electricity supply in the context of increasing electricity demand on Ireland's national grid. As described in Section 2*, Key Challenges*, the achievement of a transition to 80% of electricity consumption from renewable sources will require other technologies to ensure security of electricity supply. There is a specific need for new, more efficient conventional generation as more carbon intensive generation is be phased out. The document states that older conventional capacity '*will need to be replaced by generation that provides the same support and backup capability but is also flexible thus enabling it to support high levels of generation from wind and solar. For instance, such generation may need to increase and decrease output quickly in response to changes in output from renewable generation.*' With respect to the specific role of gas-fired generation, the Section 2 states that '*It is anticipated that natural gas will form the vast majority, and more enduring, part of this conventional generation…There will also be a need for gas-fired generation to be able to operate on gasoil/distillate as a backup fuel.*'

Energy Security Package to 2030 (2023) & Annex: Securing Our Gas Supplies

The Government's energy security package, *Energy Security in Ireland to 2030,* expanded on the *Policy Statement on Security of Electricity Supply* to establish a strategic approach to these policy objectives. With respect to the importance of back-up generation for a renewable energy transition, *Action 7* of the package is "*To work within the updated European Market Design to continue to reduce emissions associated with Ireland's conventional capacity over the medium term.*" It is stated that "*in recent years Ireland has seen the critical importance of this "back-up" [conventional] capacity – in particular in ensuring uninterrupted supplies of electricity to homes and businesses on low-sun, low-wind "dunkelflaute" days. This is an important component of energy security but also an important measure in building confidence in Ireland's ability to securely transition to a majority renewable system."*

Climate Action Plan (Climate Action and Low Carbon Development Act (2021))

Annual iterations of the Climate Action Plan since the first publication under the *Climate Action and Low Carbon Development Act* (2021) have included targets for the delivery of gas-fired power generation in light of its established role in the renewable energy transition. Chapter 11 of the Climate Action Plan 2025 re-iterates a Key Performance Indicator (KPI) of "*At least 2 GW of new flexible gas-fired generation*" capacity by 2030. Section 12.3.1 of the Climate Action Plan (2024) stated that *"Rapid delivery of flexible*

gas generation is needed at scale and in a timeframe to replace emissions from coal and oil generation as soon as possible to reduce impacts on the carbon budgets. The introduction of renewable gas generation into the grid is an important factor of ensuring a security of supply for Ireland's electricity system."

National Planning Framework 2040 (First Revision, 2025)

Objectives with respect to the development of new electricity generation are supported through the relevant strategic planning and development frameworks. At a national level, National Planning Objective (NPO) 71 is to "*Support the development and upgrading of the national electricity grid infrastructure, including supporting the delivery of renewable electricity generating development*."

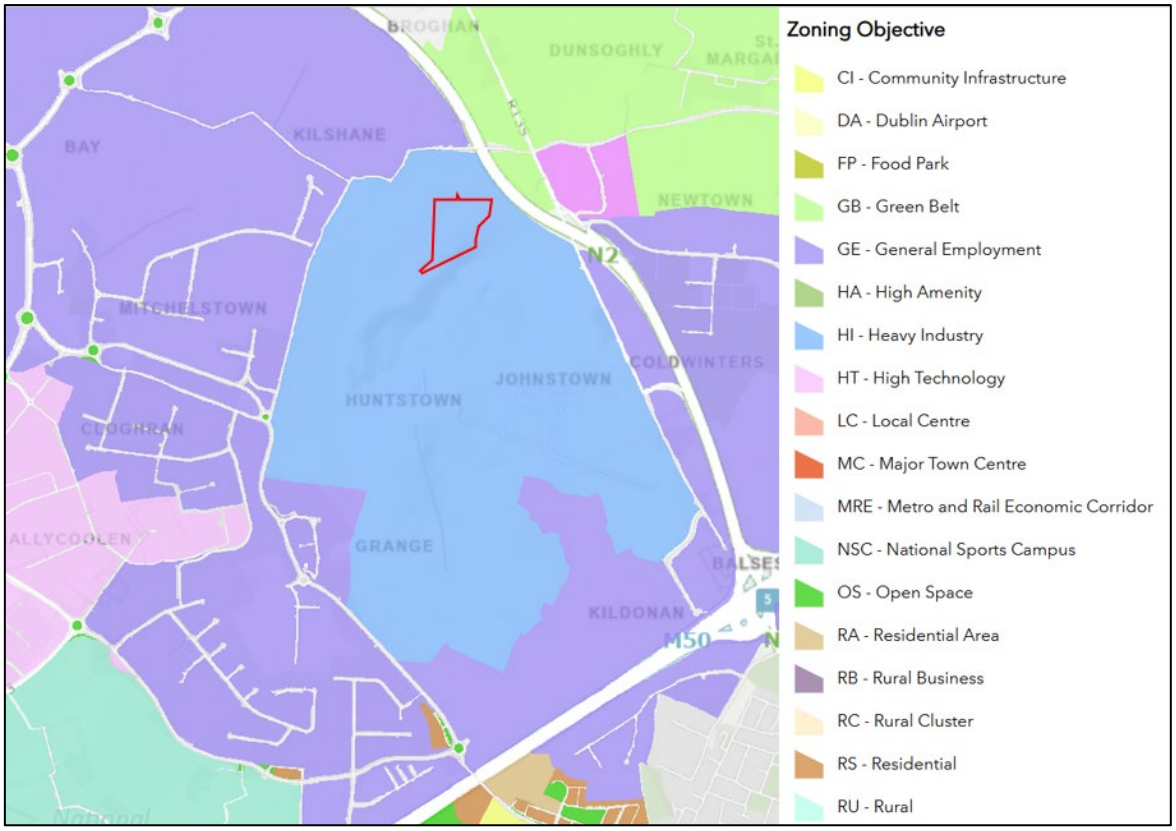
Fingal County Council Development Plan 2023-2029

At the Local Authority level, within the Fingal County Council Development Plan 2023-2029 (FCCDP), Chapter 11 "Infrastructure and Utilities," Section 11.7 states that "*Fingal … will support new infrastructure projects and technologies with particular emphasis on renewable, alternative, and decentralised energy sources, and those which are less carbon intensive in line with the Electricity and Gas Networks Sector Climate Change Adaptation Plan 2019. We will continue to support the development of a safe, secure, and reliable supply of electricity … to service the existing and future needs of Fingal and the wider Eastern Region and to strengthen all-island energy infrastructure and interconnection capacity."*

With respect to the development of new conventional capacity, including gas-fired generation, to support security of electricity supply, Policy IUP 31 details as an objective to "*Support … the Government's Policy Statement on Security of Electricity Supply November 2021 and any subsequent plans prepared during the lifetime of this Plan, to provide for the safe, secure, and reliable supply of electricity.*" Objective IUO44 details Fingal County Council's objective to "*Support the development of enhanced electricity and gas supplies, and associated transmission and distribution networks, to serve the existing and future needs of the County, and to facilitate new transmission infrastructure projects and technologies.*"

The Kilshane Energy site is within a larger area that has specifically been zoned for Heavy Industry (H1) under the Fingal County Council Development Plan (FCCDP). This zoning is intended to "*Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."*

Figure 3-1 Fingal County Council Zoning Objectives at Site[1]



The Proposed Development comprises gas-fired turbines which will produce power on an intermittent basis to be exported to the EirGrid transmission network. The energy produced by the Proposed Development will play a key role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity faces limitations. The Proposed Development will deliver 680MW of flexible capacity, thus contributing to the 2GW target established in the Climate Action Plan. Under the zoning designations and strategic planning objectives described above, the Proposed Development site is an appropriate location for a development of this nature.

If the Proposed Development does not proceed, the specific need for additional gas-fired power generation capacity to support a renewable energy transition in the state would still exist. The site will remain as undeveloped greenfield, resulting in a neutral impact on the environment. The adjacent lands within the site ownership boundary will be developed for gas-fired power generation as permitted. Considering the site's strategic location in the Greater Dublin Area and current zoning for Heavy Industry (HI), it is likely that the site would be developed for industrial purposes in the future. Therefore, opting for the '*do-nothing*' scenario would be underutilising this strategically positioned site, would not result in the opportunity for backup gas-fired power generation to support a renewables transition, and would contravene existing plans and policies.

3.3 Alternative Project Locations

As noted in Section 4.13 of the 2018 Guidelines *"some projects may be site specific so the consideration of alternative sites may not be relevant."*

[1] Source: https://fingalcoco.maps.arcgis.com/apps/webappviewer/index.html?id=668801631a4745e997c6ccf2cf1cfa51

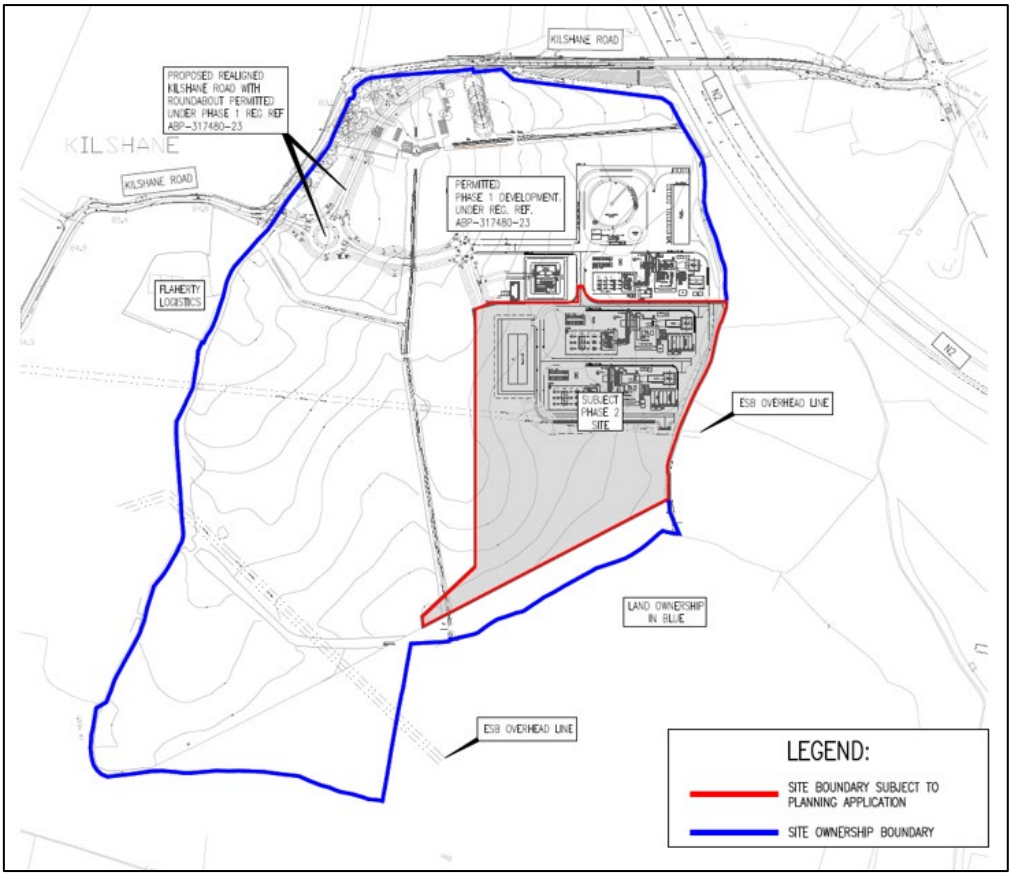
Additionally, the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA 2017) states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

The Proposed Development is an extension of the permitted gas power station development at Kilshane (Reg. Ref. FW22A/0204) (refer to Figure 3-2). The site of the Permitted and Proposed Developments is a greenfield and bareground site located at Kilshane, Dublin 11, directly west of the N2 primary road and located approx. 2 km north-west of the M50. The Proposed Development site is bounded by the Permitted Development site to the north and is within the same site ownership boundary. The site redline area comprises 4.57 ha in the eastern part of lands owned by Kilshane Energy which cover a total area of 28.56 ha.

Site selection criteria for the permitted development included availability of a suitably sized site, environmental considerations, spatial planning, and proximity to demand for electricity generation at the national, regional, and local levels. With respect to environmental considerations including noise and visual impact, few locations were appropriate for large gas turbine station installations. The site was chosen based upon its zoning under the FCCDP for heavy industry (HI), proximity to connection points, and its availability as real estate.

As a proposed continuation of the Permitted Development, alternative locations for the Proposed Development were not considered to be feasible, as this would require the construction of significant additional supporting infrastructure which would not otherwise have been required. The majority of the utilities and infrastructure already permitted under the existing planning permission will be utilized to service the proposed Phase 2 Development, with upgrades carried out where required to accommodate the additional phase. Additionally, other sites are not readily available in a similarly strategic location with an appropriate zoning for the Proposed Development. The continuation of the permitted development is an efficient and strategic use of lands under the applicant's ownership, providing additional generation capacity without the need to develop a new site for heavy industry use.

Figure 3-2 Permitted and Proposed Development Site Boundaries[2]



3.4 Alternative Layout/Design

The project design team undertook a comprehensive design process to determine an effective and efficient layout for the Proposed Development, which has regard for the operation requirements, planning requirements and the environmental sensitivities of the site and the surrounding context.

3.4.1 Alternative Layouts Within the Ownership Boundary

Consideration was initially given to the provision of new gas-fired power generation within the south-western portion of the site ownership boundary, shown in Figure 3-3 below. The development of a Gas Fired open cycle Turbine Power Generation Station comprising 8 no. turbines, AIS substation, internal roads, and ancillary supporting infrastructure was progressed through a design phase and submitted for planning permission to Fingal County Council under Reg. Ref. FW23A/0232. The layout of the power station as submitted with the planning documentation for FW23A/0232 is shown in Figure 3-4 below. However, it was ultimately reasoned that the requirement of the design for new ancillary infrastructure presented an inefficient use of land and material resources. This application was ultimately withdrawn in favor of the option to extend the permitted development. The current Proposed Development is being submitted as an alternative to the previously proposed development.

[2] Source: Drawing Ref. KPS-WMC-PH1-00-DR-C-P001

Figure 3-3 Alternative Layout No. 1 (Location Within Site Boundary)

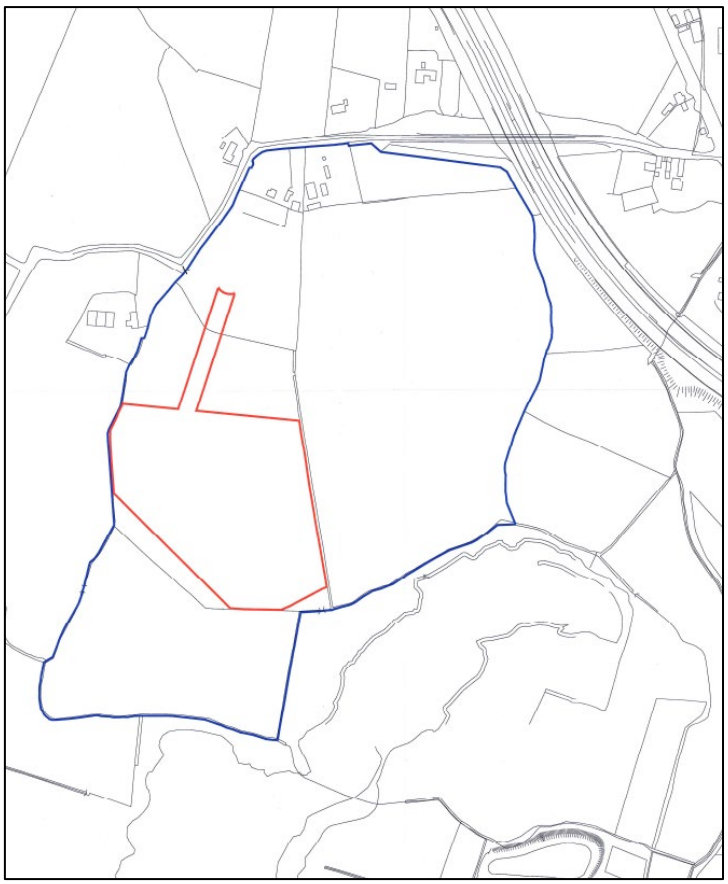


Figure 3-4 Alternative Layout No. 1



The proposed site layout was chosen taking into consideration environmental factors in addition to technological efficiencies. The layout of the Proposed Development was initially curtailed by the following factors:

- The size requirements of the proposed turbines and GIS substation;
- The need for the additional turbines to connect to associated Permitted Development infrastructure;
- The need to provide sufficient surface and stormwater attenuation storage on-site in line with the recommendations of the Greater Dublin Strategic Drainage Study;
- The need to avoid interference with the presence of overhead electricity cables traversing the centre of the Proposed Development site.

The design process was also influenced by the following environmental criteria:

- To reduce amount of disturbance to the local environment by maintaining a compact site footprint
- To ensure sustainable and orderly development, thus maximising the potential future utilisation of the zoned and serviced lands, by maintaining a compact site footprint;
- To preserve as far as possible the existing hedgerows, mature screening vegetation, and other ecological features both internally and along the boundaries of the site;
- To keep the development minor in scale and minimise the introduction of structures with potential for visual impacts;
- To maximise the screening provided by the permitted and proposed development boundary planting in combination;
- To allow space for screening mounds and associated vegetation, in order to reduce the visual impact to surrounding visual receptors; and
- To expand the already permitted Sustainable Urban Drainage Solutions (SUDS) as far as possible.

3.4.2 Alternative Layouts Within the Proposed Redline Boundary

The design for the extension of the Permitted Development was an iterative process which took into consideration the key constraints and environmental criteria described above. Due to the need to avoid interference with the overhead electricity cables traversing the site from east to west, a north-south orientation of the 2 no. turbines was not considered to be a feasible alternative layout. The alternative layouts shown in Figure 3-5 and Figure 3-6 allow sufficient space for the various elements of the Proposed Development and avoid the overhead transmission lines, however, the space available for landscaping and screening vegetation to the south of the Proposed Development is reduced.

The proposed layout (see Figure 3-7) location of the turbines to the directly to the south of the permitted development ensures a compact site footprint while allowing for the location of 2 no. sufficiently-sized underground attenuation tanks within the site boundary area to the south of the turbines.

The location of the underground attenuation tanks and GIS Substation allows space for improved landscape proposals, including the retention of native hedgerows, the provision of a larger screening mound and additional tree and hedgerow planting to the south of the turbines. These proposals provide additional screening of the Proposed Development while also enhancing biodiversity within the site boundary.

Figure 3-5 Alternative Site Layout no. 1[3]

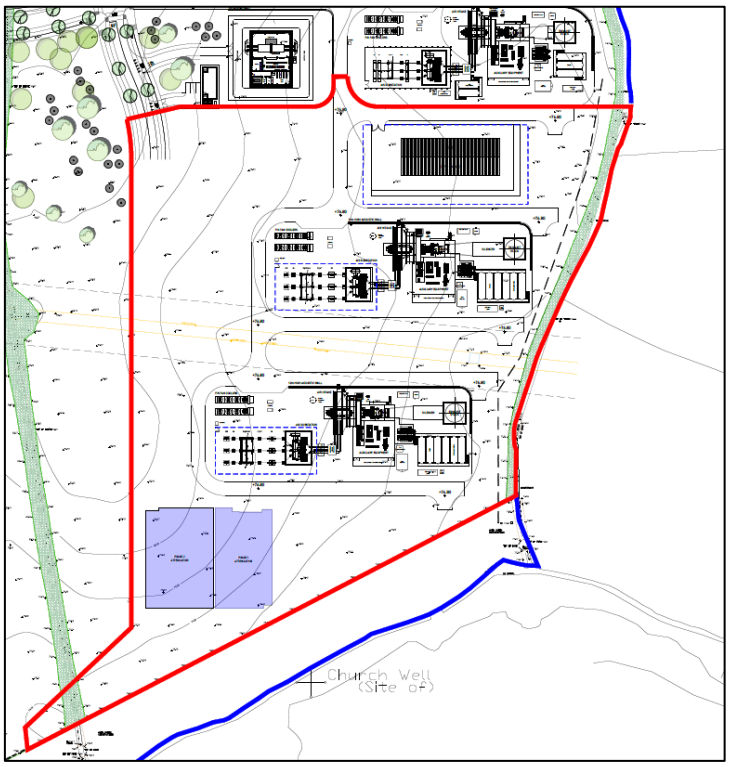
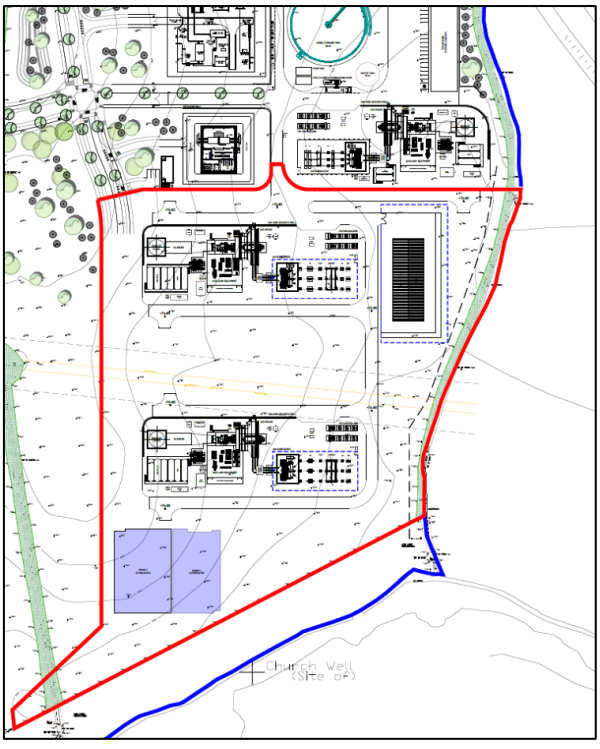
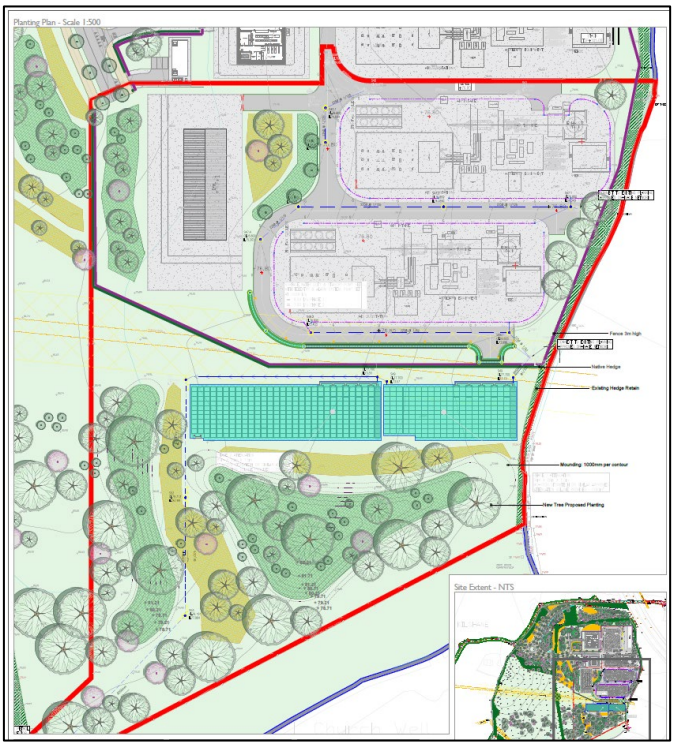


Figure 3-6 Alternative Site Layout no. 2[4]



[3] Source: Drawing ref. SK.ALT.01 (McAtavey Architects, 2025)
[4] Source: Drawing ref. SK.ALT.02 (McAtavey Architects, 2025)

Figure 3-7 Proposed Layout[5]



3.5 Alternative Processes (Technologies)

The EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022) state that within each design solution there can be a number of different options as to how the processes or activities of the development can be carried out. This section typically examines the project processes in relation to likely emissions to air, noise 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 guidelines state that "*It should be borne in mind that the amended Directive refers to 'reasonable alternatives… which are relevant to the proposed project and its specific characteristics'*."

In terms of the Proposed Development processes, the various layout options shown in Figure 3-5, Figure 3-6, and Figure 3-7 above will generally necessitate the same power requirements, and result in the same waste and environmental emissions. Infrastructure elements, such as substations, grid routes, above-ground installations (AGIs), and secondary fuel storage will be common to any large-scale thermal generation project, regardless of the technology. The Proposed Development is guided by the applicant's standard specifications and the existing Permitted Development. The flexibility to select alternative processes is limited for this type of development as opposed to a stand-alone development. The use of the chosen gas-turbine technology was determined in the design and planning phases of the permitted development; as an extension of the permitted development the selection of different gas turbine technologies was not considered feasible.

The Proposed Development will consist of two gas-fired power turbines and ancillary development including 400kV GIS substation and associated compound. Overall, the choice of gas-fired power

[5] Kilshane Energy SID Planting Plan (RMDA, 2025)

generation is lower-carbon than other fuels such as coal or oil that are associated with conventional back-up capacity. In line with the Permitted Development, the preferred technology for the gas turbines is Open Cycle Gas Turbines (OCGTs), which will be designed for dual fuel operation. While natural gas will be the primary fuel, fuel oil will be stored and used on site as an emergency backup fuel source in the event of an interruption to the gas supply.

Criteria considered when selecting the preferred technology during the design and planning phase of the Permitted Development included environmental impact, grid code compliance, emissions compliance, duel-fuel capability, the required site footprint, and €/MW installed cost. The proposed OCGT was ultimately chosen for the Permitted Development and subsequently the Proposed Development because it is compliant with all necessary regulations, minimising the environmental impact and offered the best chance of success in the capacity market auction.

The Proposed Development has also embraced the opportunity to utilise SuDS measures such as the 2 no. attenuation basins, ditches, and bioswales. These measures provide benefits to both stormwater management and biodiversity in accordance with the Greater Dublin Strategic Drainage Study (GDSDS).

These measures will be implemented along with significant planting and retention and augmentation of existing ecological features. These measures will attenuate the rate of surface water runoff from the development, intercept first flush flows and improve the quality of water that is intercepted by the surface water drainage network through biodegradation, pollutant adsorption and settlement and retention of solids.

3.6 Alternative Mitigation

The EIA process for the Proposed Development involved a team of specialists, each with expertise in a specific aspect of the environment. For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the Proposed Development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the Proposed Development. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation.

Where relevant, 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 for the Proposed Development are outlined in each of the EIAR Chapters 4-15. These measures have been specifically chosen to address the potential environmental impacts of the Proposed Development and to minimise any adverse effects on the environment. By considering a range of mitigation measures and strategies, the specialist team has sought to ensure that the Proposed Development is as environmentally sustainable and responsible as possible.

3.7 Alternative Future 400 kV Grid Connection

As described in Section 2.10.1.4 of Chapter 2 (Description of the Proposed Development), the Proposed Development will require a separate and additional 400 kV grid connection. It is therefore anticipated that a separate planning application for the associated grid infrastructure will be submitted by the applicant at a later date.

At this stage of project development, the detailed design and final alignment of the grid connection have not yet been confirmed. However, a preliminary cable alignment has been identified and is illustrated in Figure 3-8 below.

Only one grid connection route has been considered as part of this assessment. This approach reflects the early stage of project design and the significant technical constraints associated with alternative connection options.

Figure 3-8 Future 400kV Grid Connection

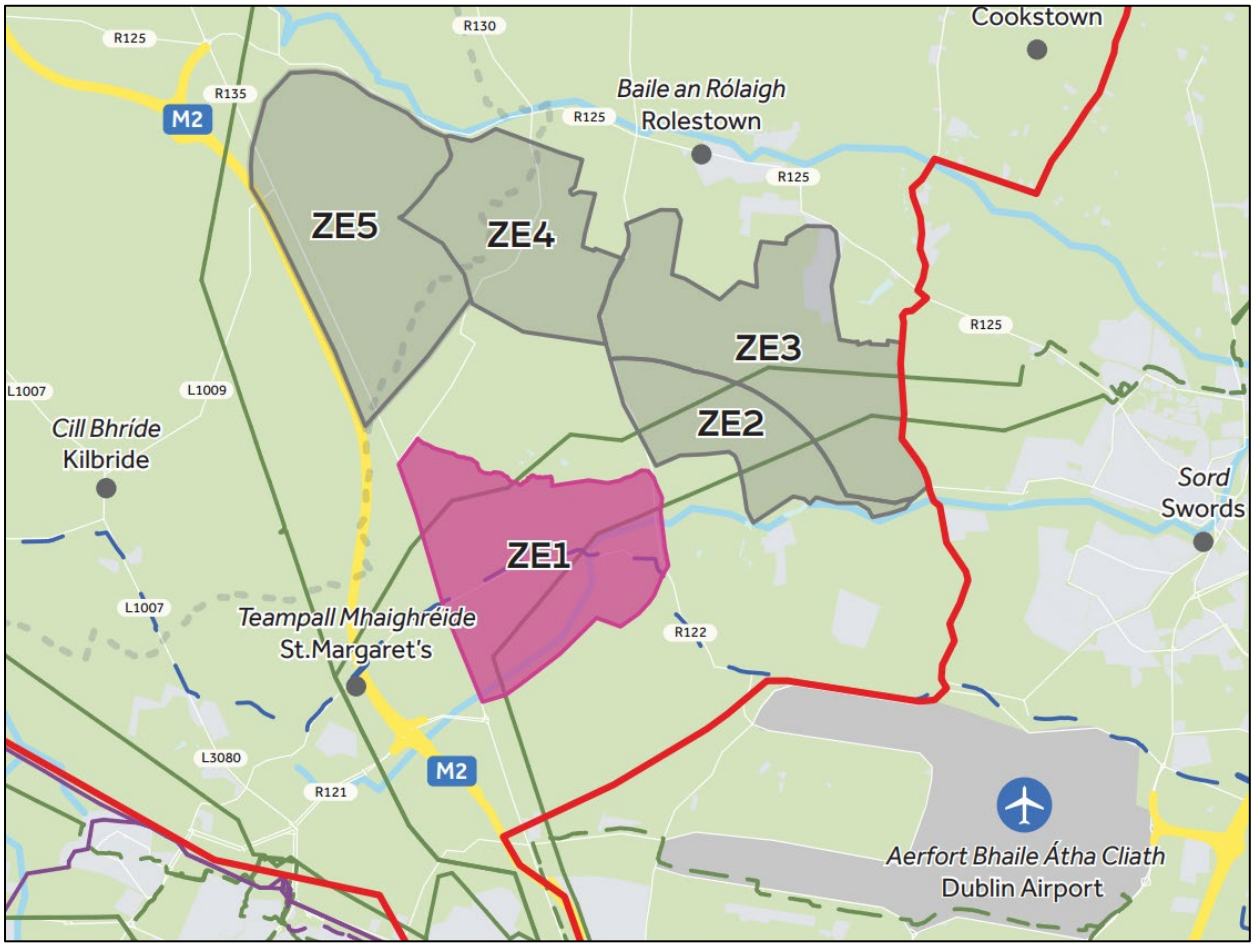


It is well documented by EirGrid[6,7] that short-circuit limitations within the Dublin transmission network severely restrict the availability of future 220 kV connections for new generation infrastructure. As a result, connection at 220 kV is not considered technically viable for the Proposed Development.

Given the requirement to accommodate up to 680 MW of new thermal generation, connection at 400 kV has been identified as the only technically feasible solution. In this context, EirGrid is currently progressing the Fingal to East Meath Grid Reinforcement Project[8], which includes the development of a new 400 kV Gas-Insulated Switchgear (GIS) Substation. The preferred zone for this new substation has been identified by EirGrid as ZE1, located to the north of Kilshane[9] and outlined in Figure 3-9.

[6] https://cms.eirgrid.ie/sites/default/files/publications/Short-Circuit-Summary-for-Industry-27032025.pdf
[7] https://cms.eirgrid.ie/all-island-ten-year-transmission-forecast-statement-2024#:~:text=The%20All%2DIsland%20Ten%20Year,/files/publications/TYTFS2024_study%E2%80%A6
[8] https://www.eirgrid.ie/fingaleastmeath
[9] https://cms.eirgrid.ie/sites/default/files/publications/Fingal-East-Meath-Update-February-2025.pdf

Figure 3-9 Assessed Zones Fingal to East Meath Grid Reinforcement Project



The alignment shown in Figure 3-8 represents the preliminary routing from the future 400kV GIS Substation at the preferred ZE1 zone to the Proposed Development site. This alignment is assessed as the only technically feasible connection option currently available to facilitate the Proposed Development and, as such, is the only route assessed within this EIAR with respect to potential cumulative effects. Alternative routes were not considered reasonable due to technical and network constraints.

3.8 Conclusions

Based on the assessment of reasonable alternatives (in relation to location, scale, design, technology, mitigation) relevant to the Proposed Development and its specific characteristics as set out in this chapter, the selected site is a suitable location for the Proposed Development from an environmental, strategic and planning perspective. As a proposed extension to a permitted gas-turbine development, the potential alternative locations, layouts, and technologies were limited as compared to a stand-alone development.

The northern portion of the landbank is currently zoned as HI (Heavy Industry)- *Use classes including fuel depot/fuel storage, industry – high impact, and sustainable energy installations are permitted in principle for this zoning*. The Proposed Development is considered to be in keeping with this zoning objective in addition to the Energy Security Package to 2030 and the Climate Action Plan 2024/2025 objectives to increase flexible gas-fired capacity by 2GW by 2030.

The siting and layout of the Proposed Development has been carefully selected based on a suitably comprehensive assessment of reasonable alternative site locations, layouts and technologies. The Proposed Development presents minimised environmental impacts, while maximising the strategic

potential of the site with respect to the Permitted Development, its proximity to gas and electricity infrastructure and demand, and its zoning.

In conclusion it is considered that the proposed site has capacity for the additional development and is highly suitable for the Proposed Development.

Chapter 4 – Human Health and Population

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4. HUMAN HEALTH AND POPULATION

4.1 Introduction

This Human Health and Population Impact Assessment has been prepared to assess the likely significant effects on human health population 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 be 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 regard 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 and Geology;
- Chapter 6 – Hydrology and Hydrogeology;
- Chapter 8 – Air Quality;
- Chapter 10 – Noise and Vibration;
- Chapter 11 – Landscape and Visual Impact; and
- Chapter 13 – 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:

- 2016 Census carried out by the Central Statistics Office (CSO) 24 April 2016. Made available from https://www.cso.ie/en/
- 2022 Census results carried out by the Central Statistics Office (CSO) 03 April 2022. Made available from https://www.cso.ie/en/
- Pobal HP Deprivation Index based on 2016 Census Data (CSO) Made available from https://www.pobal.ie/
- Pobal HP Deprivation Index based on 2022 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
- Health and Safety Authority (HSA) online register of Notified Seveso Establishments available from https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/
- Significant Modifications Assessment, Kilshane Energy Peaking Plant. AWN Consulting. 2026.

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 ED the that are either entirely contained withing or partially within 1 km of the Proposed Development site. In the case of the Proposed Development, the site is located within the The Ward (267158), and within 1 km of the site is the ED's of Dubber (ED 267066).

Figure 4-1 Location of the Proposed Development within the Study Area[1]



4.2.4 Population Impact Assessment Categories

4.2.4.1 Assessment of Sensitivity of Population

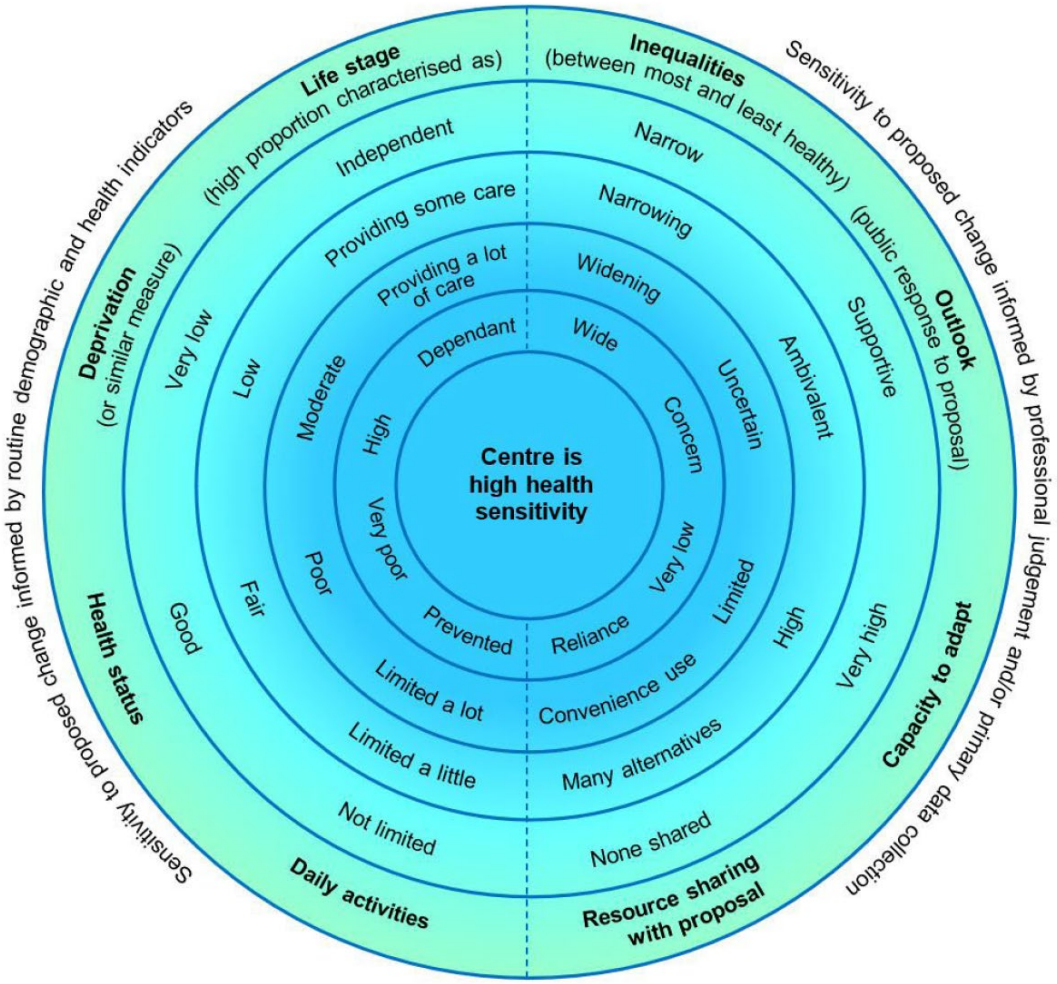
The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary. The Health Impact Assessment Guidance (IPH, 2021) sets out conceptual model of the different

[1] Google Earth Pro (2026)

components of sensitivity (Figure 4-2). 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 availably 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, employment, tourism and recreation amenities.

Figure 4-2 Health sensitivity: conceptual model[2]



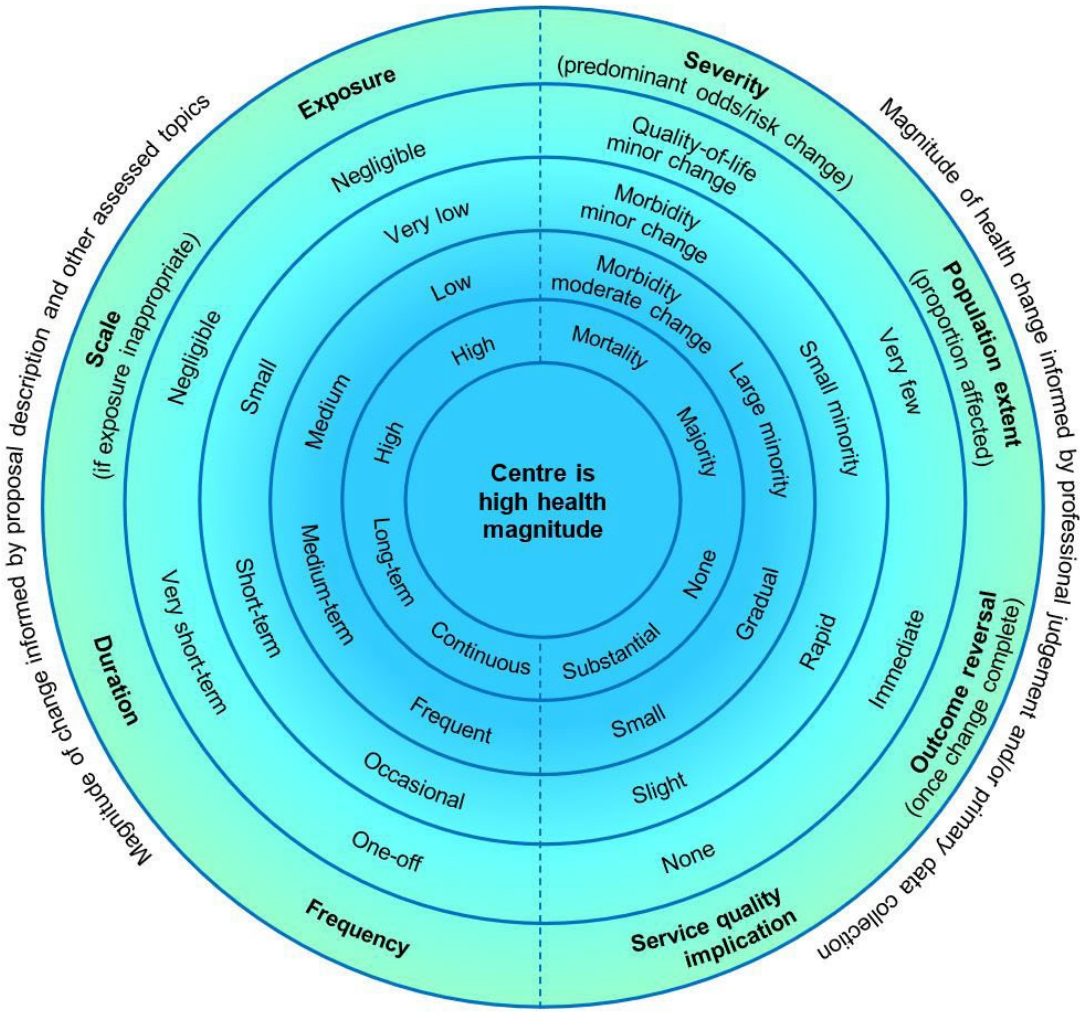
4.2.4.2 Magnitude of Impact

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 4-3). Again, this model provides different components of

[2] Source: Health Impact Assessment Guidance (IPH, 2021)

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 4-3 Health magnitude: conceptual model[2]



4.2.4.3 Significance of Effects

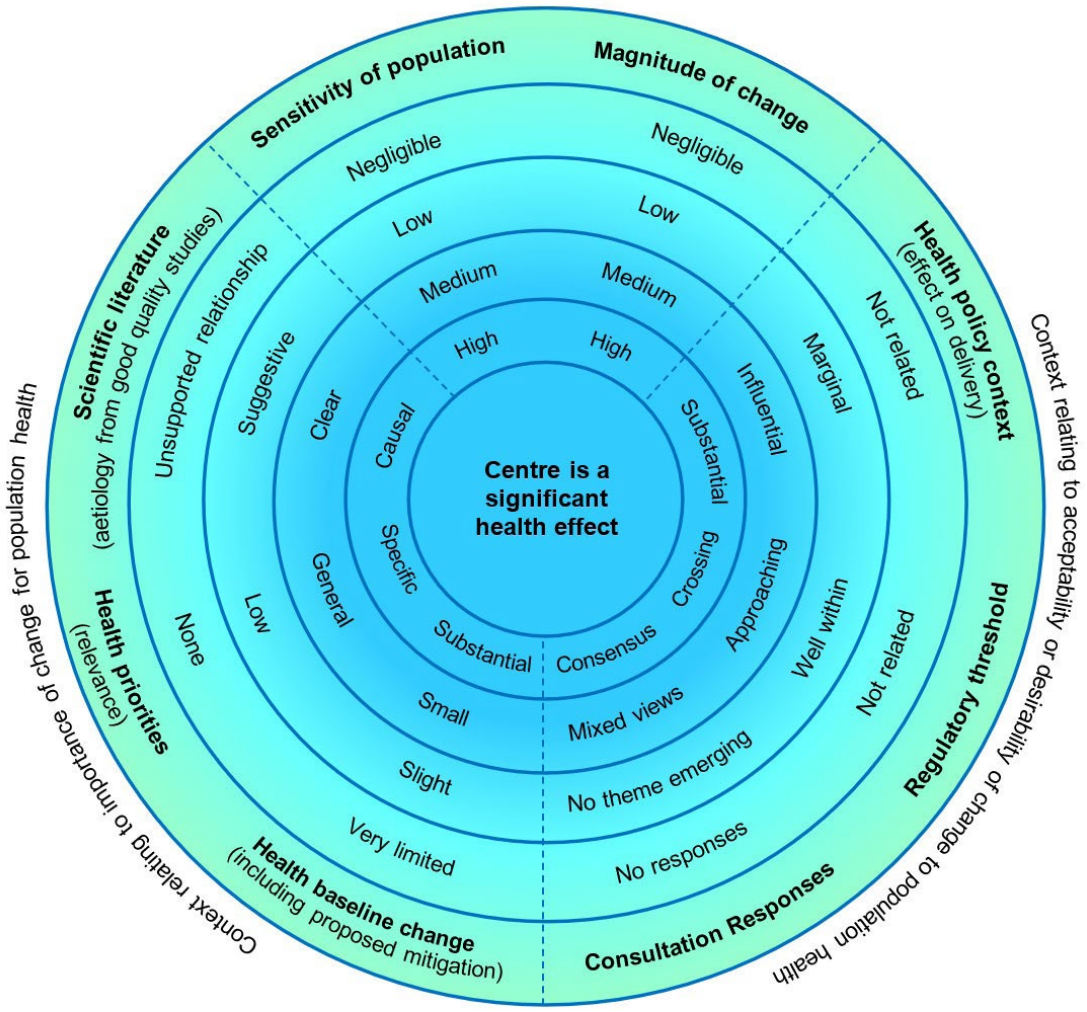
Significance relies on informed, expert judgement about what is important, desirable or acceptable with regards to changes triggered by the proposal in question. The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between 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 4-4 Health significance: conceptual model[2]



4.2.5 Forecasting Methods and Difficulties Encountered

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 most recent census of population was carried out by the CSO on the 3rd of April 2022. The census compiles data for the whole state as well as smaller individual areas including counties, cities, towns, and electoral divisions. Taking into consideration the location of the Proposed Development, the census information on population, age profile, employment, and social class, has been analysed in relation to the development site.

Table 4-1 denotes the population change of the State and the electoral divisions which make up the study area for the census years 2016 and 2022. The Study Area has seen an overall growth in population with both EDs presenting a higher growth percentage when compared to average National rates for the Republic of Ireland (ROI).

Table 4-1 Population Change at National, County and Electoral Division Level from 2016 – 2022[3]

Area	Population for Census Year		% Change 2016-2022
	2016	2022	
State - Republic of Ireland	4,761,865	5,149,139	+8.1
The Ward	9,602	13,242	+37.9
The Dubber	7,372	8,812	+19.5

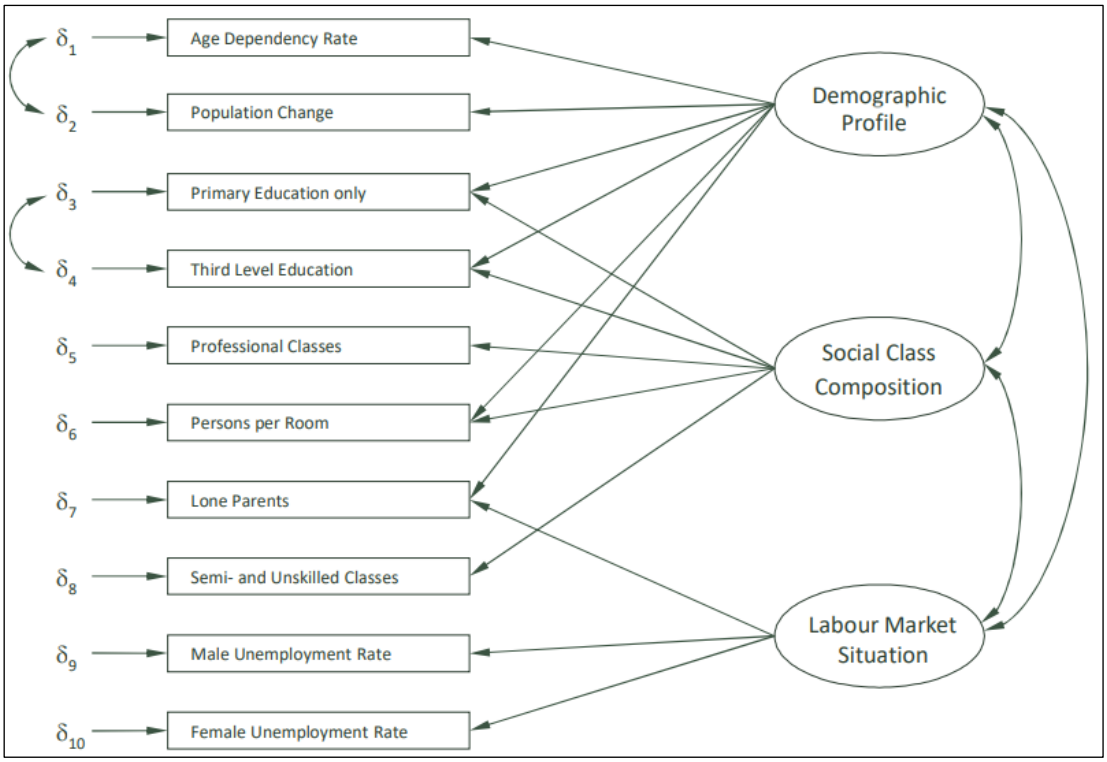
4.3.1.2 Deprivation

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.

[3] Source: www.cso.ie

Figure 4-5 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 4-5 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[4]

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 2022 Census. These figures show for the year 2022 that within the study area, the EDs of The Ward and Dubber are classified as "Marginally Above Average", in line with the Sensitivity (Deprivation) of Co. Dublin.

[4] Source: Pobal HP Deprivation Index

Table 4-3 Deprivation Score within the Study Area[5]

Area	Deprivation Score	Pobal HP Description
Co. Dublin	4.12	Marginally Above Average
The Ward	5.53	Marginally Above Average
The Dubber	3.28	Marginally Above 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 is 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 has decreased dependency slightly from 2016 to 2022. Both EDs are shown to be less dependent when compared with ROI, indicating a mostly 'independent' population within the Study Area. The study area can be defined as per the conceptual model as 'providing some care' to 'providing a lot of care'. This indicates that there is a larger proportion of working population within the Study Area, likely to be out of the home during the day and would therefore be less likely to be impacted by a development within the area as compared to a more dependant population.

Table 4-4 Age Dependency Ratio within the Study Area[6]

Area	Age Dependency Ratio for Census Year (%)	
	2016	2022
State - Republic of Ireland	52.70	53.22
The Ward	35.02	31.49
The Dubber	30.24	27.02

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

[5] Pobal HP Deprivation Index, 2022 Census)

[6] Pobal Geo-Profiling, 2022 Census

and to a slightly higher degree than the ROI average for The Ward, and a slightly lower degree for the Dubber.

Table 4-5 Self-reported Measure of Population Health[7]

Area	% population describing their general health					
	Not Stated	Very Bad	Bad	Fair	Good	Very Good
State - Republic of Ireland	6.74%	0.32%	1.41%	8.64%	29.66%	53.23%
The Ward	11,14%	0.15%	0.65%	5.55%	27,38%	55.12%
The Dubber	19.06%	0.14%	0.96%	5.06%	27.99%	46.78%

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 both EDs have a lower % of individuals with a disability overall than the national average.

Table 4-6 Persons with a disability[7]

Area	Persons with a disability	Population	% Persons with a disability
State - Republic of Ireland	1,109,557	5,149,139	22%
Reisk	1,791	13,242	13.5%
Kilmeaden	1,284	8,812	14.5%

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 an overall growth in population between 2016 and 2022, with both EDs presenting a higher growth percentage when compared to average National rates. The Pobal HP Deprivation Index shows both EDs being 'Marginally Above Average', and with a lower age dependency ratio when compared to ROI, indicating a greater 'independent' population within the Study Area. The data indicates that the majority of the population on working age, implying a greater degree of self-sufficiency and resilience to change.

The information available for the study area shows that a large proportion of the population (46.78% to 55.12%) describes their health status as 'Very Good' and a small proportion (0.65% to 0.96%) as 'Bad' or 'Very Bad'. The data shows that both EDs have a lower % of individuals with a disability overall than the national average, indicating that for most of the population within the study area there are relatively limited restrictions on daily activity.

Taking these factors into consideration, it can be concluded that the population in the study area exhibits a relatively low sensitivity to change, categorising it with regard to the criteria set out in Figure 4.2 as having a Low population sensitivity.

[7] CSO, 2022 Census

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. Refer to Figure 4-6 for baseline area map.

Figure 4-6 2.5km Radius Baseline Description Area



4.3.2.1 Community and Social Infrastructure within the Study Area

4.3.2.1.1 Residential and Employment areas

The Proposed Development site fully comprised within lands zoned to provide for heavy industry. As outlined in the Fingal County Development Plan 2023 – 2029 this zoning objective is characterized as:

> *"Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses"*

There are a number of industries, warehouse developments and commercial developments within 2.5km from the Proposed Development. The Millenium Trade Park, Northwest Business Park, Orion Business Campus, Ballycoolin Business Park, Blanchardstown Corporate Park, Stadium Business Park, Premier Business Park and Rosemount Business Park are all located to the southwest of the Proposed Development. The Bracetown Business Park, Dublin Airport Logistics Park, Quantum Logistics Park, Horizon Logistics Park and Williamsville Industrial State are all located to the east and southeast from Proposed Development.

Some of the facilities within the study area and their distances from Proposed Development site boundary include, but are not limited to:

- PD Flaherty logistics (logistic services) – c. 300m west.
- DB Schenker Units 635, 624, 803 and 900 (warehouse) – c.1.1km southwest and c.750m, 630m and 770m west.
- Dennehy Renault Pro + (car dealer) – c. 540m west.
- Sprint Coatings Limited (powder coating service) – c. 590m west.
- Ardex Ireland (building materials supplier) – c. 670m west.
- Phasor Maintenance (property maintenance) – c. 730m west.
- Rhenus Air & Ocean Ltd. (shipping company) – c. 890m west.
- Kirkby Tyres (wholesaler) – c. 982m west.
- Exopest Environmental Services (pest control services) – c. 1km west.
- IMed Healthcare – c. 950m west.
- Kuehne + Nagel Crate Wash (warehouse) – c. 1.1km west.
- TSS - Technical Support Services (transport parts manufacturer) – c. 1.2km west.
- Hales Freight Ireland (freight forwarding service) – c. 1.2km west.
- DSV (logistics services) – c. 1.3km west.
- MotorCorp (car dealer) – c. 1.2km west.
- JABIL (warehouse) – c. 1.1km west.
- NCTpass (car repair and maintenance service) – c. 1.2km west.
- Amazon Logistics (warehouse) – c. 1.4km west.
- Rhenus Logistics Limited (freight forwarding service) – c. 1.4km southwest.
- Hutton & Meade Hyundai (car dealer) – c. 1.5km southwest.
- Renault Trucks Ireland (truck dealer) – c. 1.7km west.
- Argent Equipment (Ireland) Limited (vehicle testing centre) – c. 1.7km west.
- Central Pump Supplies Ltd (pump supplier) – c. 1.1km southwest.
- Covermore Financial mortgage and financial broker – c. 1km southwest.
- KB Sports Hub (sports shop) – c. 900m southwest.
- The Bolt Company (fastener supplier) – c. 900m southwest.
- PCI pharma (manufacturer) – c. 1km southwest.
- Eramol Ltd (pharmaceutical company) – c. 1.1km southwest.
- Edgescan (computer security services) – c. 950m southwest.

- Java Republic | Ballycoolin Café and Roastery (cafe) – c. 1.1km southwest.
- Controlled Environments Company (industrial equipment supplier) – c. 1.1km southwest.
- E2G Logistics (freight forwarding service) – c. 1.1km southwest.
- Rtff Business Services Limited (transportation service)– c. 1.2km southwest.
- DVL (warehouse) – c. 1.2km southwest.
- Thorn Environmental Ltd (packaging supply store)– c. 1.4km southwest.
- Northgate Vehicle Hire – Dublin (van rental) – c. 1.5km southwest.
- Brandwell Ireland Limited (fashion store) – c. 1.3km southwest.
- Obelisk (telecommunications engineer) – c. 1.3km southwest.
- Equinix DB4 (computer support and services) – c. 1.3km southwest.
- Des Kelly Interiors (warehouse) – c. 1.4km southwest.
- Baby Elegance Warehouse – c. 1.4km southwest.
- Tech Move Solutions (logistics service) – c. 1.4km southwest.
- Transocean Forwarding Limited (freight forwarding service) – c. 1.4km southwest.
- Glanmore Foods (food manufacturer) – c. 1.3km southwest.
- Corrib Food Products (food storage facility)– c. 1.3km southwest.
- Hawthorn Logistics (logistics service)– c. 1.1km southwest.
- VWR International Limited (laboratory equipment supplier) – c. 1.4km southwest.
- Masterlink Logistics (shipping company)– c. 1.4km southwest.
- Westbrook Motors - Car Sales & Service Centre – c. 1.9km southwest.
- Wincanton logistics – c.2km southwest.
- VTL Transportation Services – c. 2.1km southwest.
- Wells Cargo Logistics Ltd – c. 2km southwest.
- Windsor MotorMall – c. 2.2km southeast.
- Joe Duffy BMW Dublin – c. 2.2km southeast.
- Joe Duffy Volkswagen (North Dublin) – c. 2.3km southeast.
- Dunnes Stores – c. 2.4km southeast.
- Charlestown Shopping Centre– c. 2.4km southeast.
- Scania Mc Elvaney Motors Ltd (car dealer) – c. 2.3km southeast.
- Dnata Catering & Retail, Dnata 1 building (warehouse) – c. 1.1km southeast.
- Dnata 2 (Aerlingus Catering) deliveries (warehouse) – c. 1.2km southeast.
- Harvey Norman Heron House Electrical Warehouse – c. 800m east.
- DHL Supply Chain (warehouse) – c. 400m east.
- Unit 1, Quantum Logistics Park (warehouse) – c. 350m east.
- TJ O'Mahony | KIlshane Cross, Dublin | Builders Providers, Hardware & DIY Superstore (building materials supplier) – c. 350m northeast.
- Kilshane Motors (motor vehicle dealer) – c. 200m northeast.
- Begleys Fresh Produce (fruit and vegetable processing) – c. 400m northeast.
- Broughan Motors – c. 1km north.
- Kilshane Autos Ltd – c. 1km north.
- Wellington Cars – c. 1km north.
- Shanowen Plant Hire Limited (demolition constractor) – c. 1.8km north.

The area is predominantly a mix of industrial, commercial and agricultural lands, characterized by a dispersed settlement pattern with the majority of residential units being single, standalone structures spread across the landscape. Hollywoodrath, located c. 2.1km east of the Proposed Development site, is the only area of dense residential settlement identified within the 2.5km radius.

The nearest sensitive receptors to the Proposed Development site are the dwellings located approximately 210m - 320m to the north-west, north-east and east of the site. Two dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89) which are located to the north of Proposed Development along Kilshane Road have been previously identified as nearest sensitive receptors for the Permitted Development (Reg.Ref. ABP-317480-23) and are due to be

demolished under An Coimisiún Pleanála Case reference: PL06F.321196 / Planning Authority Case Reference: FW24A/0339E. The dwellings site will be converted into a storage container depot and therefore they are not considered to remain as a sensitive receptor for Proposed Development.

4.3.2.1.2 Education, Childcare, Schools

There are only a few educational centres within the study area including:

- St Margaret's National School (primary school) – 2.1km northeast
- Young Explorers Club – 1.5km southwest
- Tigers Childcare Office (montessori school) – 2.1km southwest
- Giraffe Childcare Blanchardstown – 2.4km southwest
- Bright Futures Creche, Montessori and Afterschool – 2.1km southwest
- Professional Development (adult education school) – 2.2km southwest
- Little Mariners After School – 2km southwest
- Little Harvard Blanchardstown (montessori preschool) – 2.4km southwest
- Mercury Apprentice Development Centre (engineering school) –1.9km southwest

The closest secondary schools are located in Tyrrelstown, approximately 3km to the west, and the closest higher education institution to the Proposed Development is the Technological University (TU) Dublin Blanchardstown, located approximately 3.3km to the southwest.

4.3.2.1.3 Healthcare Services

The only healthcare services located within the study area are:

- Opcare Dublin Clinic – 1.9km southwest
- Millennium Health (medical clinic) – 1.3km southwest
- Irish HomeCare (home care services) – 2.3km southwest
- Blanchardstown & Inner City Home Care – 2.2km southeast

The closest hospitals within the study area are the National Orthopaedic Hospital Cappagh located c. 2.7km south from the Proposed Development and the Connolly Hospital Blanchardstown, located approximately 4.1km southwest, both outside the study area.

4.3.2.1.4 Emergency Services

There are no Garda Stations or Fire Stations within the study area. The nearest Garda Station and Fire Station are the Finglas Garda Station, and the Finglas Fire Station located c. 3.7km southeast of the site.

4.3.2.1.5 Green Infrastructure, Landscape and Amenity within the Study Area

Due to the largely industrial, commercial and agricultural nature of the surrounding environment, the study area is not particularly characterized by any recreational facilities or public green infrastructure.

In terms of landscape amenity, the development site exists at present is mostly greenfield and bare ground with tree lines existent along the Kilshane site boundary. The site's topography generally slopes from west to east with a high point of 80.50m OD Malin on the western boundary, and a low point of 77.54m OD Malin on the eastern boundary.

According to Chapter 12, there have been a large number of archaeological excavations undertaken within the study area (including within the Proposed Development), and the site of the Proposed Development has been subjected to geophysical survey and archaeological testing. Whilst these assessments identified archaeological remains to the immediate north of the Proposed Development, no archaeological feature were identified within the Proposed Development lands.

There are three sites within the study area listed in the Record of Protected Structures for Fingal County, all of which are also listed in the Sites and Monuments Record. According to Chapter 12, none of these will be impacted, directly or indirectly, by the Proposed Development.

There are no Architectural Heritage sites located within the proposed site or in close proximity to the site. Dunsoghly Castle (DU014-005001-) is located c. 0.9 kilometers (km) to the northeast and will not be impacted by the Proposed Development, directly or indirectly.

The lands in the immediate vicinity of the site are similar in character. The Huntstown Quarry is located in close proximity to the south. The greater area is also characterized by the presence of commercial and industrial developments, road network and a few scattered residential dwellings.

The change of the current landscape within the development site into a fast start peaking Gas Turbine Power Plant will result in a negative landscape impact.

According to the Fingal Development Plan 2023-2029, as outlined in section 11.3.1.1 of Chapter 11 (Landscape & Visual Impact Assessment), southwestern part of the 'Low Lying Agricultural' LCT which is designated a 'Modest' Landscape Value and 'Low' Landscape Sensitivity. Areas of low sensitivity are defined within the Landscape Character Area (LCA) as having 'the potential to absorb a wide range of new developments subject to normal planning and development control procedures.

Section 11.3.2 of Chapter 11 states that based on a review of Sheet No. 14 – 'Green Infrastructure' within the current Fingal Development Plan, there are no views located within the study area.

4.3.2.2 Tourism within the Study Area

Tourism is returning to strong growth and continues to play a hugely influential role in Irelands economic success. Tourism is an important indigenous sector in Fingal, in terms of generating revenue and employment.

The tourism in County Fingal is mainly based on day trip visitors, particularly to coastal locations and heritage attractions and stay-over visits, largely concentrated around Dublin Airport. The Fingal County Council's vision is that Fingal is:

> *'An attractive, vibrant and sustainable tourism destination delivering a distinctive experience for local residents, domestic and international visitors.'*

The Proposed Development site is located in relative proximity to the Dublin airport, approximately 5km west. Despite this proximity, the Proposed Development lands, as well as its adjoining vicinity, are zoned to provide for heavy industry and to provide opportunities for general enterprise and employment. The lands are not positioned near any notable landmarks or areas of tourism significance.

4.3.2.3 Natural Resources within the Study Area

4.3.2.3.1 Geological Heritage, and Economic Resources

Natural resources and land use in the study area has also been considered as they may have implications for the development of the lands. A review of Geological Survey Ireland (GSI) online maps has shown that the closest active quarry is the Huntstown Quarry adjacent to the project site to the south. This quarry is listed as an active limestone quarry, a mineral locality (Mineral Location Ref. 3032) with limestone argillaceous as key mineral and a Geological Heritage Area (Site Code DF022).

There are also two other mineral localities within the study area including Mineral Location Ref. 5309 and Ref. 5310 presenting limestone as key mineral and located approximately 1.7km southwest and southeast from Proposed Development, respectively.

4.3.2.3.2 Recreational Waters and Bathing Waterbodies

A review of EPA maps that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no protected Recreational Waters or Bathing Waterbodies within the Study Area.

The nearest waterbody to the Proposed Development is the Huntstown Stream (EPA_Name: Huntstown 08) located to the south c. 30m from the site boundary. From this point the Huntstown Stream flows in a north-easterly direction, until also joining the River Ward at St. Margaret's Golf and Country Club and eventually discharging into the Malahide Estuary, approximately 14km downstream.

4.3.2.3.3 Drinking Water Resources

A review of GSI 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. The nearest Groundwater Source Protection Area is the DUNBOYNE PWS, located c. 9km west of the site, while the closest Group Scheme Source Protection Area is Kiltale, located c. 23km northwest, both outside the study area for Proposed Development.

As stated in Chapter 6 Hydrology and Hydrogeology, the GSI dataset for groundwater wells and springs does not show any wells drilled or springs at the site or in the immediate vicinity. The well in closest proximity to the site is located approximately 30 m to the south (Church Well). None of the wells is the surrounding area listed are categorised as domestic use. The area is serviced by Local Authority mains therefore it is unlikely that any wells are used for potable supply.

4.3.3 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

According to the data available by GSI (2025), 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 details are provided in Chapter 5 Land, Soils and Geology.

4.3.3.1.1 Proximity to Seveso or Industrial Emissions Sites

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

As outlined in section 1.5.3 of Chapter 1 (Introduction), the Permitted Development of reference FW22A/0204/ABP-317480-23 at the Kilshane site includes large amounts of diesel fuel storage for turbine operations and is therefore classified as a Lower Tier Seveso establishment. As such, the Kilshane site will

be subject to the provisions of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015.

In support of the Proposed Development, a Significant Modifications Assessment has been prepared by AWN Consulting and will be sent to the Health and Safety Authority (HSA). As result of a Detailed Analysis, the Significant Modifications Assessment concluded that the proposed modification does not constitute a Significant Modification. Therefore, the proposed modification will result in a not significant additional impact with respect to Seveso related accidents.

According to the EPA records, active IE or IPC licensed facilities in the study area of 2.5km from Proposed Development include.

- Huntstown Bioenergy Unlimited Company – IE Licence no. P0993
- Huntstown Power Company Limited – IE Licence no. P0483
- Energia Power Generation Limited – IE Licence no. P0777
- Huntstown TEG – IE Licence no. P1194
- Starrus Eco Holdings Limited (Millenium Business Park) – IE Licence no. W0183
- South Dublin Routing 4 No. 2 Limited – IE Licence no. P1210
- Blancomet Recycling IE Limited – IE Licence no. P1115
- Breedon Materials Limited – IPC Licence no. P0081
- Starrus Eco Holdings Limited (Cappagh) – IE Licence no. W0261
- Hitech Plating Limited – IPC Licence no. P0434
- K2 Strategic Infrastructure Ireland Limited – IE Licence no. P1143
- ADSIL Blanchardstown – IE Licence no. P1172
- K2 Strategic Infrastructure Ireland Limited – IE Licence no. P1143
- Corduff FlexGen – IE Licence no. P1138
- Swords Laboratories Unlimited Company Trading As Bristol Myers Squibb Cruiserath Biologics – IE Licence no. P0552

4.3.3.1.2 Risk of Flooding

The potential risk of flooding on the site was also assessed. A Flood Risk Assessment (FRA) was carried out by Waterman Moylan for the Proposed Development site as part of this EIAR and is included as a stand-alone document to this application.

The Proposed Development includes the implementation of SuDS and an attenuation system that have been designed with an allowance 20% increase in flows due to climate change as suggested per 2009 Guidelines.

According to the FRA, the residual risk for all flood sources considered (tidal, fluvial, pluvial, ground water and human/mechanical error) are deemed 'extremely low' to 'low'.

4.4 Characteristics of the Proposed Development

The Proposed Development will consist of the construction of two additional Gas Turbines and associated infrastructure at the permitted Kilshane Gas Turbine Power Generation Station (development ref. FW22A/0204, ABP-317480-23) with an output of 680 Megawatts (MW), to be located at at Kilshane Road, Kilshane, Finglas, Dublin 11.

A full description of the development as reflected in the site notice description which can be found in Chapter 2.

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 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual Impact); and Chapter 13 (Traffic and Transportation).

A summary of the main potential impacts as they are relevant to human health criteria during construction and operation 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
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – 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 a ***not significant, short term*** *and* ***positive*** impact on the economy and employment of the local and wider area.

4.5.1.2 Potential Impacts on Landscape, Amenity and Tourism

There will be no impact on the local parks or the larger amenity areas. It is not anticipated the Proposed Development will have significant impact on local tourism or shopping amenities. The Proposed Development will not create any significant wastewater discharge which could have a potential impact on local amenities or the local population. Therefore, impacts are expected to be ***neutral***, ***not significant*** and ***short term.***

Additionally, the construction phase of the Proposed Development will result in some notable modifications to the existing landcover and landform and introduce new visual elements that could be perceived as intrusive for human receptors. Overall, human health impacts during construction due to changes on the landscape and visual intrusion is considered to be ***negative, short-term***, ranging from ***imperceptible*** to ***moderate*** depending on the distance of the Proposed Development.

4.5.1.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Land, Soils and Geology), a reduction in soil quality via historical or unmitigated pollutants entering the soil has the potential to lead to negative impacts on human health during construction. Hydrocarbons and petroleum products for example have a risk for humans by inhaling the fumes / dust from contaminated soil. Depending on the type of contaminant and the level of exposure, soil contamination can have serious health implications.

In the absence of mitigation measures the potential impacts to human health during the construction phase on land, soils and geology are ***negative***, ***not significant*** and ***short term.***

With reference to Chapter 6 (Hydrology and Hydrogeology), as there are no recorded recreational waters, bathing waterbodies, no downgradient surface water abstraction points or Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas. Therefore, there is no potential for impacts on human health and populations with respect to the environmental factors Hydrology and Hydrogeology.

4.5.1.4 Potential Impact from Air Quality on Human Health

The primary elements in relation to the construction of the Proposed Development with the potential to impact air quality and subsequently human health are:

- Dust soiling effects on people and property from general site preparation, construction vehicles and construction activities;
- Potential human health effects from dust (PM_{10} and $PM_{2.5}$) emissions from general site preparation, construction vehicles and construction activities;
- Engines emissions from construction vehicles or machinery and construction traffic.

There are between 1-10 high sensitivity residential properties within 250 m of the construction site boundary (Figure 8.4, Chapter 8). In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) as referenced in Chapter 8 the overall sensitivity of the area to dust soiling impacts is low based on the IAQM criteria outlined in Table 8.19. In addition, the IAQM criteria outlined in Table 8.19 indicates that the worst-case sensitivity of the area to dust-related human health effects is low.

Construction dust tends to be deposited within 250 m of a construction site however, 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 Cork Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 8.5.1). 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 200 days per year have rainfall over 0.2 mm. Therefore, it can be determined that over 54% of the time dust generation will be reduced due to natural meteorological conditions.

Combining the magnitude of the construction activities – demolition, earthworks, construction and trackout (movement of vehicles) – with the overall sensitivity of the area indicates there is at most a low risk of dust-related human health effects associated with the construction of the Proposed Development (refer to Table 8.21 of Chapter 8). In the absence of mitigation there is the potential for ***direct, short-term, negative*** and ***slight*** impacts to human health as a result of the Proposed Development.

There is also the potential for traffic emissions to affect 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 from any further assessment as there is no potential for significant impacts to air quality with respect with human receptors, as described in Section 8.4.1.2 of Chapter 8.

4.5.1.5 Potential Impact from Noise and Vibration on Human Health

Noise criteria are provided by relevant bodies with consideration of the likely impact of noise on human health. The construction phase is short-term and therefore any elevated levels of noise will be of limited duration and, as a result, are not expected to pose any risk to human health. In terms of the noise exposure of construction workers and potential hearing damage that may be caused due to exposure to

high levels of noise, the Safety, Health and Welfare at Work (General Application) Regulations 2007 (Statutory Instrument No. 299 of 2007) provides guidance in terms of allowable workplace noise exposure levels for employees. The Regulations specify two noise Action Levels at which the employer is legally obliged to reduce the risk of exposure to noise. The appointed contractor will be required to comply with the Regulations and provide appropriate noise exposure mitigation measures where necessary. Therefore, in the absence of mitigation there is the potential for ***direct, short-term, negative*** and ***not significant*** impacts to human health as a result of the Proposed Development.

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 and operational phases is presented in Chapter 13 (Traffic and Transportation).

During construction, there will be temporary local disruption to pedestrian, cyclists, and vehicular traffic particularly during the construction of the upgraded junction and also due to increased construction traffic on the road network which will also perform turning movements in areas that impact traffic. The potential impacts may include:

- Increased vehicle movements associated with construction staff travelling to / from the site;
- Increased vehicle movements consisting of HGV and construction plant that may result in traffic congestion on roads;
- Increased queuing and congestion;
- Increased conflict between pedestrians / cyclists and vehicular traffic; and
- Severance of pedestrian and cycle routes.

As per Chapter 13, there is potential for construction traffic to have a moderate negative effect on the surrounding environment with a consequential ***short-term, not-significant negative*** impact on Population and Human Health.

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 4.3.3 there is a negligible risk of seismic activity, volcanic activity and sea level rise. There have been no recorded landslide events at the site. Due to the generally flat/level local topography and the underlying strata there is a negligible risk of a landslide event occurring at the site.

The Kilshane site is classified as a Lower Tier Seveso establishment and is subject to the provisions of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015. As the development site is COMAH regulated, no impacts are expected with respect to Human Health during construction phase. There are no other COMAH sites located within Proposed Development study area that could impact the development site.

As stated in the FRA carried out by Waterman Moylan for the Proposed Development site, the residual risk for all flood sources considered (tidal, fluvial, pluvial, ground water and human/mechanical error) is deemed 'extremely low' to 'low'.

The potential effect is therefore ***imperceptible***, and unlikely, with respect to 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 outlined in the following sections of this chapter and in detail within the corresponding chapters of this EIA Report as follows:

- Chapter 8 – Air Quality and Climate
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – Traffic and Transportation

Once operational, the Proposed Development will provide for additional power generation capacity and will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity faces limitations. This will result in a ***positive, slight*** and ***long-term*** impact in the area during the operational phase.

The development will also generate a minor number of jobs as it will require 10 additional staff to run operations with an associated ***positive, imperceptible*** and ***long-term*** impact.

4.5.2.2 Potential Impacts on Landscape, Amenity and Tourism

The Proposed Development once operational will have no impact on local tourism or shopping amenities. There will be no impact on the local parks or the larger amenity areas.

Visual impacts and amenity impacts perceived by individual persons are highly subjective and difficult to characterise. The landscape character of the subject lands will be notably changed from its current largely undeveloped character to that of built environment. However, mounded berms and extensive planting of native tree species to the north of the Proposed Development will partially screen views from the L3120 and N2 corridor, reducing human receptors views over the proposed changes.

Overall, it is anticipated that impacts on human health impacts due to landscape changes will be no greater than ***slight, negative*** and ***long-term,*** while impacts on human health due to visual intrusion will be no greater than ***moderate, negative, long-term***.

4.5.2.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Land, Soils and Geology), there are no sensitive economic features, potential contamination or historical geological features at the site. During the operational phase of the Proposed

Development there is no potential for impact on human health and populations due to changes in land, soil, and geology.

Therefore, on this basis in the absence of mitigation measures the potential impacts during the operational phase on human health and populations due to the potential for contamination of soils are ***neutral***, ***imperceptible*** and ***long term***

With reference to Chapter 6 (Hydrology and Hydrogeology) there is no potential for unmitigated off-site flooding as a result of the increased hardstanding areas due to the proposed design and drainage infrastructure proposed.

There are no recorded recreational waters, bathing waterbodies, surface water abstraction points located downstream of the Proposed Development site. In addition, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas defined by the GSI within which development is limited in order to protect drinking water supplies from potential pollution located in the vicinity of the Proposed Development site. Therefore, there is **no potential for impacts on human health and populations** with respect to the environmental factors Hydrology and Hydrogeology***.***

4.5.2.4 Potential Impact from Air Emissions on Human Health

As outlined in Chapter 8 (Air Quality), National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are set for the protection of human health and the environment. The applicable limit values in relation to the Proposed Development are set out in Table 8.1 of Chapter 8.

The key elements in relation to the operation of the Proposed Development with the potential to impact air quality and subsequently human health are:

- Release air pollutant emissions (primarily nitrogen oxides (NO_X), carbon monoxide (CO), sulphur dioxide (SO_2) and particulate matter (as PM_{10} and $PM_{2.5}$) resultant of the operation of the proposed turbines.
- Road traffic accessing the site will emit air pollutants and greenhouse gases.

A detailed air dispersion modelling of emissions (NO_X, CO, SO_2 and particulate matter as PM_{10} and $PM_{2.5}$) from the Proposed Development determined that pollutant concentrations will be in compliance with the relevant limit values set out in Table 8.1 which are set for the protection of human health. Therefore, emissions from the Proposed Development will have a ***direct, long-term, negative, not significant*** impact on air quality.

As per Section 8.4.2.1 in Chapter 8, a detailed air quality assessment of operational phase traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to local air quality with respect with human receptors.

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

The potential health effects of exposure to excessive noise include sleep disturbance, either from immediate physiological reactions during sleep (i.e. awakening reactions or body movements during sleep) and long-term adverse health effects (i.e. self-reported sleep disturbance). The Environmental Noise Guidelines for the European Region (World Health Organisation, 2018) recommend that the *Community Noise Guidelines* (WHO, 1999) and the *Night Noise Guidelines for Europe* (WHO, 2009) indoor guideline values remain valid e.g. setting an internal night-time level of no more than 30 dB $L_{Aeq,8hr}$ i.e. the level below which no adverse health effects were expected to occur.

Noise and vibration impacts associated with the development have been fully considered within Chapter 10 of the EIA Report.

The main potential noise impacts associated with the operation of the Proposed Development are noises related to power plant equipment and additional vehicular traffic on the public roads. Review of the predicted noise levels associated with the main potential noise impacts have been analysed further in Chapter 10 (Noise and Vibration). The detailed assessments have found that that the site-specific levels comply with noise criterion relevant to these proposed activities.

As presented in Chapter 10, Table 10-16, the introduction of the Proposed Development will result in a change from the existing noise levels no greater than 1 dB for all locations. The expected health effect due to noise from the Proposed Development is classified as ***neutral***, ***not significant*** and ***long-term***.

There is no vibration source from the routine operations of the development that would cause impacts at nearby noise-sensitive locations. Therefore, the operational vibration effects of the Proposed Development are classified as ***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 13 (Traffic and Transportation). The traffic modelling results show that during operational phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour, representing ***neutral*** and ***not-significant*** alterations to the junctions resulting in a neutral impact on human health.

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 4.3.3 there is a negligible risk of external natural disasters; including seismic activity, volcanic activity and sea level rise. There have been no recorded landslide events at the site. Due to the generally flat/level local topography and the underlying strata there is a negligible risk of a landslide event occurring at the site.

COMAH related impacts are deemed not significant as the Significant Modifications Assessment prepared in support of the Proposed Development concluded after Detailed Analysis that the proposed modification does not constitute a Significant Modification. Additionally, the Kilshane site is COMAH regulated, therefore no impacts are expected with respect to Human Health during operations. There are no other COMAH sites located within Proposed Development study area that could impact the development site.

As stated in the FRA carried out by Waterman Moylan for the Proposed Development site, the residual risk for all flood sources considered (tidal, fluvial, pluvial, ground water and human/mechanical error) are deemed 'extremely low' to 'low'.

The potential effect is therefore ***neutral, imperceptible, long-term***, and unlikely with respect to Major Accident Hazards and Natural Disasters on Population and Human Health during Operational Phase of the Proposed Development.

4.6 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 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual Impact); Chapter 13 (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 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual Impact); Chapter 13 (Traffic and Transportation).

4.6.1.2 Landscape, Amenity and Tourism

As per Section 11.6.1 in Chapter 11, there are limited construction-stage mitigation measures as the site is well established and heavily screened from surrounding receptors. In this regard, there is no requirement for site hoarding or additional screening to screen the construction stage effects as much of the construction stage works will be heavily screened by the existing surrounding vegetation.

4.6.1.3 Land and Water Emissions

All mitigation measures outlined within the Chapter 5 (Land, Soils and Geology) and Chapter 6 (Hydrology and Hydrogeology) will be implemented in accordance with 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, 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.

4.6.1.4 Air Emissions

A suite of best practice dust mitigation measures appropriate for sites with a low risk of dust impacts are outlined in Section 8.8.1 of Chapter 8. These include measures for dust control at the site to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities including:

- Communication.
- Construction Works Area Management
- Operating Vehicles / Machinery
- Earthworks Activities
- Construction Activities
- Measures specific to trackout (transport of dust and dirt from the construction works areas onto the public road network)
- Monitoring

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 Section 10.5.1 Chapter 10.

- 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 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, including:

- 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; and
- 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.
- Vibration from construction activities to off-site residences be limited to the values set out in Table 10-7 in Chapter 10.

4.6.1.6 Traffic and Transportation

For the Construction Phase, the developer will adopt a number of mitigation measures as outlined in Section 13.6.1 of Chapter 13. A Construction Stage Mobility Management Plan and a Traffic Management plan will be implemented and will include, but will not be limited to:

- Encourage staff to avoid using of their cars and use alternative modes of transport in order to reduce the number of cars on the road and the need of car parking spaces.
- Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers.
- Update the public transport information adjacent to the development on an ongoing basis.
- Adequate signposting will be located on-site to ensure the safety of all road users and construction workers.
- Hoarding will be set up around the perimeter to prevent pedestrian access.

- The contractor will be obliged to ensure that any sub-contractors engaged on the site are made fully aware of the required mitigation measures and that they are properly implemented as part of any works that they undertake.
- Manage the entry and exit of heavy vehicles to and from the site. The assignment of staff to assist pedestrians and traffic flow when heavy vehicle movements occur on the roads.
- Define schedules for the entry and exit of materials and machinery to limit the generation of noise on the network to specific time slots.
- Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
- Ensure all vehicle movement (on site) occur within normal working hours. (Other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons)

4.6.1.7 Major Accident Hazards and/or Natural Disasters

All mitigation measures outlined in the submitted CEMP will be implemented throughout the construction phase of the development. This will include mitigation measures outlined within this EIAR. The CEMP includes emergency response procedures for environmental incidents. It will be continuously updated to manage risks during construction.

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 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual Impact); Chapter 13 (Traffic and Transportation).

4.6.2.1 Businesses and Residences

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

4.6.2.2 Landscape, Amenity and Tourism

The main mitigation-by-avoidance measure employed in this instance is the siting of the development in a robust landscape where the zoning aligns and where it is surrounded by other commercial and industrial developments of a similar scale. The Proposed Development will also avail of landscaping and planting measures associated with the permitted development to its immediate north including earthen berms and substantial areas of native planting.

4.6.2.3 Land and Water Emissions

The Proposed Development incorporates SuDs measures including oil interceptors on drainage, surface water attenuation and containment of the fuel tank and bunding of generators in accordance with EPA best practice. Strict separation of surface water and wastewater will be implemented within the development, and the site will operate in compliance with the requirements of an Irish Water (IW) licence.

An Environmental Safety and Health Management System (EMS) will be implemented at the Proposed Development during operations along with emergency response procedures in case of accidents

4.6.2.4 Air Emissions

No additional mitigation measures are proposed for the operational phase of the Proposed Development. Air dispersion modelling has determined that concentrations of all pollutants are in compliance with the relevant ambient air quality standards.

4.6.2.5 Noise and Vibration Emissions

Noise from external plant will be minimised by purchasing low noise generating equipment and incorporating appropriately specified in line attenuators for stacks and exhausts where necessary. A 12m noise barrier is also included in the project design. With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment. No further mitigation is deemed required.

4.6.2.6 Traffic and Transportation

A Travel Plan will be implemented and developed on an ongoing basis with the triple objectives of promoting sustainability, enhancing public transport and reducing dependency on the use of the private car. It is important to strike an appropriate balance between promoting new development and preventing excessive car parking provision that can undermine cycling, walking and public transport use.

The Developer will be obliged to appoint a member of the site staff, who supports the philosophy of the Plan, as a Transport Co-ordinator. The Co-ordinator's roles in the development, implementation and management of the Plan shall include:

- Promotion of the Travel Plan to site workers;
- Implementation and maintenance of the Plan;
- Monitoring progress of the Plan;
- Production of information reports for the Developer and the Planning and Highway Authorities; and
- Ongoing assessment of the objectives of the Plan.

4.6.2.7 Major Accident Hazards and/or Natural Disasters

Once operational, the Proposed Development will form part of a COMAH regulated site which will be subject to the provisions of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015. As a COMAH regulated site, any potential effect is imperceptible, and unlikely in respect of major accident hazards and human health during the operational phase of the Proposed Development. Therefore, no specific mitigation measures are required.

Potential impacts with respect to natural disasters are also imperceptible, and unlikely. 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 positive impact with respect to employment and local business due to 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, not-significant, short-term*** socioeconomic impact.

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

The preventative and reduction measures outlined will ensure the success of the integrated design mitigation strategy. As a result, the anticipated impacts on human health from changes to the local landscape and visual intrusion are expected to be no greater than ***negative, slight,*** and ***short-term*** for landscape changes, and ***negative, moderate,*** and ***short-term*** for visual intrusion.

The Proposed Development will have no discernible effect on local tourism or amenities during construction stage.

4.7.1.3 Land and Water Emissions

The proposed mitigation measures, together with the implementation of the submitted CEMP, will effectively reduce the risk of soil contamination. In addition, the proper identification and management of contaminated soil will safeguard against potential impacts on human health. Importantly, no source–pathway linkages have been identified to potable water supplies or recreational water amenities.

Overall, residual impacts during the construction phase in respect of the environmental factors of Soils, Geology, Hydrology and Hydrogeology will be ***short term, imperceptible*** and ***neutral.***

4.7.1.4 Air Emissions

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 the construction phase of the Proposed Development with respect to air quality and human health is ***short-term, direct, negative, localised*** and ***not significant.***

4.7.1.5 Noise and Vibration Emissions

As detailed in Chapter 10 (Noise and Vibration), there will be some impact on nearby noise sensitive receptors during construction, due to noise emissions from site activity, traffic, and other activities. The application of noise and vibration limits and limits on the hours of operation, along with implementation of appropriate noise and vibration control measures (as summarised in Section 10.6.1), will ensure that noise and vibration impact is kept to a minimum. Due to the short-term duration of the work, the noise and vibration limits in place, this phase of work will not give rise to any significant health effects. With mitigation, impacts to human health due to noise and vibration as a result of the Proposed Development effects are ***direct, short-term, negative*** and ***not significant.***

4.7.1.6 Traffic and Transportation

As shown in the Chapter 13, construction will likely have a ***neutral*** and ***not significant*** impact on pedestrians and cyclists. Due to the proposed mitigation measures outlined in Sections 13.6.1 and 4.6.1.6, the effect of the Proposed Development will be ***temporary*** to ***short-term*** and minimised during the construction phase.

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

Once operational, the Proposed Development will provide for additional power generation capacity and will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity faces limitations. This will result in a ***positive, slight*** and ***long-term*** impact in the area during the operational phase.

The Proposed Development will result in a minor number of new jobs, resulting in an ***long-term imperceptible, positive,*** impact due to increased employment opportunities during the operational phase.

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

Overall, the Proposed Development does not conflict with landscape and visual policies and objectives within the current Fingal CDP and represents the intensification of energy infrastructure within the local landscape context. As a result, impacts from the landscape change are deemed ***moderate, neutral to negative,*** and ***long-term***.

As per Chapter 11, residual visual effects are in the lower order of magnitude as the development tends to be well screened and where visible, will not detract notably from the prevailing robust industrial character of the surrounding landscape. Visual operational impacts are deemed to be ***negative, imperceptible to moderate*** and ***long-term***.

The Proposed Development will have no discernible effect on local tourism or amenities during operational stage

4.7.2.3 Land and Water Emissions

There are no source pathway linkages to potable water supplies or water amenities. As such the implementation of the design measures will ensure that the residual impacts during the operational phase in respect of the environmental factor of Soils, Geology, Hydrogeology and Hydrology are ***long-term, imperceptible, neutral***.

4.7.2.4 Air Emissions

As detailed in Chapter 8 (Air Quality), detailed air dispersion modelling of emissions from the Proposed Development determined that pollutant concentrations will be in compliance with the relevant limit values. Therefore, emissions from the Proposed Development will have a ***direct, long-term, negative*** and ***not significant*** impact on human health.

4.7.2.5 Noise and Vibration Emissions

Proprietary noise and vibration control measures have been employed including plant selection and acoustic screening, in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby NSLs. With respect to traffic, any change in noise levels associated with vehicles at road junctions in the vicinity of the Proposed Development is expected to be imperceptible. Therefore, residual human health impact will remain as will continue to be ***direct, neutral***, ***not significant*** and ***long-term***.

4.7.2.6 Traffic and Transportation

As shown in the traffic assessment for the Proposed Development, during operational phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour, representing ***neutral*** and ***not-significant*** alterations to the junctions, therefore with a neutral impact on human health.

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 cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments are discussed below. For details on the developments considered refer to Chapter 2, Section 2.10 of this EIA Report.

Existing developments that are already built and in operation contribute to the 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 developments has been assessed in the preceding sections of this chapter.

4.8.1 Construction Phase

In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust, noise, among others.

Contractors for the Proposed Development will be contractually required to operate in compliance with a project-specific CEMP and Construction Traffic Management Plan which will include the mitigation measures outlined in this EIA Report. The construction phase will be restricted by the binding limits for noise, dust, and emissions to water.

The implementation of mitigation and monitoring measures detailed in Chapter 6 as well as adherence to any future planning conditions will ensure there will be minimal cumulative potential for change in surface water during the construction phase of the Proposed Development. The residual human health cumulative impact with respect to of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be ***neutral, imperceptible*** and ***short-term.***

According to the IAQM guidance (2024), should the construction phase of the Proposed Development coincide with the construction phase of any other development within 500m then there is the potential for cumulative construction dust impacts. The Proposed Development has been assessed as having at most a low risk of dust-related human health impacts during the construction phase. A number of mitigation measures have been proposed in order to ensure significant dust impacts do not occur. Provided the mitigation measures outlined in Section 8.6.1 of Chapter 8 (Air Quality), are implemented throughout the construction phase of the Proposed Development significant cumulative dust impacts are not predicted. Impacts are predicted to be ***direct, short-term, negative*** and ***not significant.***

All known permitted developments in the study area have been considered to access the traffic impacts of the Proposed Development. Chapter 13 (Traffic and Transportation) states that the traffic analysis conducted shows that the Proposed Development at Kilmeaden does not result in any cumulative impacts on the local or strategic road network during the construction phase.

The implementation of mitigation measures within each chapter and detailed in Section 4.6.1; as well as the compliance of granted developments with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the Proposed Development.

4.8.2 Operational Phase

With regard to cumulative visual effects, the permitted and proposed developments will generally be viewed together and as such perceived as one single development. Furthermore, the proposed and consented developments will benefit from a high degree of existing screening by the surrounding dense vegetation and other built developments. Whilst there will be a notable intensification of energy infrastructure within the study area should the proposed and permitted developments be realised, it is not considered that there will be any significant cumulative impacts.

The implementation of design measures and monitoring measures detailed in chapter 6 as well as the compliance of the permitted development with their respective planning conditions, will ensure cumulative impacts are neural with no resulting effects on human health.

The potential cumulative impacts of the Proposed Development during the operational phase in terms of air emissions and noise generation in the context of the Permitted Development have been considered in Chapter 8 (Air Quality) and Chapter 10 (Noise and Vibration).

Detailed air dispersion modelling of cumulative emissions from the Proposed Development and neighbouring facilities determined that pollutant concentrations will be in compliance with the relevant limit values. Therefore, emissions from the Proposed Development will have a ***direct, long-term, negative*** and ***not significant*** effect on air quality and human health.

As per Chapter 10 (Noise and Vibration), the resulting cumulative background noise levels will be within the adopted night-time noise criteria outlined in relevant EPA noise criteria that are applicable to the development. Therefore, no negative cumulative impacts on human health are expected as result of proposed operations.

Potential future and committed developments in the surrounding area were also identified, and their trip generation established (Section 13.5.3, Chapter 13). However, as the initial comparison already demonstrated increases below the 5% significance threshold, additional detailed assessment or traffic modelling incorporating growth factors and these cumulative trips was not required.

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).
- Central Statistics Office. Statbank Databases (Accessed June 2025, https://www.cso.ie/en/databases/).
- Central Statistics Office. Census of Population, 2011 and 2016. (Accessed June 2025, https://www.cso.ie/en/census/).
- Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU).

Chapter 5 – Land, Soils and Geology

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5. LAND, SOILS AND GEOLOGY

5.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the Proposed Development on the land, soil and geological aspects of the site and surrounding area, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e. the EIA Directive) (European Union, 2014a). This Chapter also provides a characterisation of the receiving land, soil and hydrological environments within the subject lands and within a wider study area in the vicinity of the Proposed Development. 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.

This chapter was prepared by Marcelo Allende (BSc, BEng) and Denis Power. Further detail on the authors' profile and relevant experience is provided in Section 1.3.2.1. in Chapter 1 - Introduction.

5.2 METHODOLOGY

5.2.1 Criteria for Rating Effects

This section establishes the criteria, and guidance used to rate the significance of the potential impacts of the Proposed Development project on the land, soil and geological aspects of the site and surrounding area.

Alongside the legislation, policy, and guidance outlined in Chapter 1, this chapter is prepared in line with the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013). This assessment includes a review of the existing environment, the potential impacts of the Proposed Development, mitigation measures, and the potential impacts.

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 document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII), formerly National Roads Authority (NRA) (TII, 2009), is referenced where the methodology for assessment of impact is appropriate. Furthermore, in line with the TII Guidelines, an assessment of the attribute importance has been undertaken in order to provide a basis for the assessment of the impact provided. The attribute importance considers the potential as well as the existing use of the surface water features as a water resource i.e., water supply, fisheries and other uses, as well as ecological habitat requirements.

In particular, the Transport Infrastructure Ireland (TII) (formerly National Roads Authority) criterion is used for estimating the importance of the soil and geological attribute (please refer to the preliminary construction environmental management plan).

The magnitude of the potential environmental impacts effects on the land, soil and geological environment is based on the TII matrix presented in the preliminary construction environmental management plan and the quality, significance and duration of potential impacts are described in this chapter in accordance with the criteria provided in Chapter 1 (Introduction), Table 1.2.

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 quality, significance, and duration of the potential impacts, residual effects, and cumulative effects are described using standard EIA descriptive terminology, included in Chapter 1 of this EIAR.

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 or requirement to remove it off-site as waste for disposal or recovery.

5.2.2 Legislation, Guidance & Planning Policy

The baseline study and impact assessment were undertaken in accordance with the following key guidance and established best practice:

- Environmental Protection Agency (EPA) Advice notes on current practice in the preparation of Environmental Impact Statement (EPA, 2003) and Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022a).
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Transport Infrastructure Ireland - Road Drainage and Water Environment (TII, 2015).
- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013); and
- 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).
- Water Framework Directive 2000/60/EC.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation, regulations and guidelines. 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 (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 S.I. No. 366 of 2016).
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010).
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988.
- Local Government (Water Pollution) Acts 1977-1990.
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998.
- Water Services Guidelines for Planning Authorities Draft (Department of Housing, Planning and Local Government, 2018).
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board).
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers.

- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.
- CIRIA C648 Control of Water Pollution from Constructional Sites.

Land, soil and geology resource management in Ireland is dealt with in the following key pieces of legislation and guidelines:

- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).
- Waste Management Acts 1996 as amended.
- Environment Agency (EA), Land contamination: risk assessment (EA, 2020).
- BS 10175:2011 + A2:2017 Investigation of potentially contaminated sites. Code of practice (British Standards Institute, 2017).
- CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice (CIRIA, 2001).
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Transport Infrastructure Ireland, The Management of Waste from National Road Construction Projects (TII, 2017).
- Environmental Protection Agency, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA, 2013).
- Local Authority planning guidance as applicable; and
- Consolidated EIA Directive 2011/92/EU and 2014/52/EU.

5.2.3 Sources of Information

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

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

Site specific data was derived from the following sources:

- Site Investigation Report. Kilshane, Ballycoolin, Dublin 15. Site Investigation Ltd., December 2021;
- Various design site plans and drawings; and
- Consultation with site engineers.

5.3 RECEIVING ENVIRONMENT

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

5.3.1 Land Use, Topography and Site History

The site is located to north west of Dublin city centre, adjacent to the N2 national carriageway and to the north east of Ballycoolin industrial estates. The Proposed Development site is c. 5.22 hectares of partly developed and partly greenfield land located south west of the N2 flyover intersection of Kilshane road

and Kilshane Cross in the townland Kilshane/Piperstown, Dublin 11 (Refer to Figure 5.1 below). The subject site is currently a greenfield site, used for agricultural purposes. There is no existing surface water drainage network adjacent to or on-site. The site is comprised of multiple fields separated by hedgerows, and generally slopes from west to east. Surface water, rainfall, is generally percolated through the site via grass and soil. The topographic survey has confirmed that the internal and boundary hedgerows contain ditches which convey flow to an unnamed ditch system to the east of the site, during heavier rainfall events. These ditches only serve the subject site and the agricultural fields immediately to the west, located between the subject site and the Kilshane Road, and do not convey any upstream watercourse.

This ditch generally flows in a north-easterly direction to join the River Ward at St. Margaret's Golf and Country Club. The River Ward is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary.

The majority of the site is currently in use for arable agricultural activities, to the North of the site is a gas turbine operated by Kilshane Energy Limited. Access/ entrance is found in the north portion of the site via a driveway off Kilshane road. The northwest of the site is occupied with building structures characterised by a residential and associated agricultural function. The south of the site is bounded by agricultural land, directly adjacent to Huntstown Quarry and Huntstown Powerplant. The site is bounded to the east by the N2 national carriageway, to the north by Kilshane Road, and to the west by agricultural land.

Land use in the vicinity of the site is characterised by a mixture of primarily agricultural and an industrial function. Land to the north is occupied by a gas turbine operated by Kilshane Energy LTD, while the north east is dominated by farmland and scattered residential dwellings with an associated agricultural function with the exception of Bay Lane Quarry. Dublin Airports boundary is approximately 1.6 km to the north east. Huntstown Quarry and adjacent Huntstown Powerplant are located directly to the south, while Dublin Airport Logistics Park and Northwest Business Park are found to the east and west of the site, respectively. Further south are more greenfield lands and the M50.

According to the EPA (2025), there are 5 no. licensed activities currently active in the vicinity of the subject site (between 550 and 1 km to the south of the southern boundary of the development site). These are:

- Energia Power Limited (P0077-02).
- Huntstown Power Company (P0483-04).
- Huntstwon Bioenergy Limited (P0993-02).
- Huntstown TEG (P1194-01).
- Kilshane Energy Limited (P1208-01).

Kilshane Energy Limited was granted a license for the combustion of fuels in installations with a total rated thermal input of 50 MW or more on the 28th of May 2025 (P1208-01). This site has yet to begin operations.

Hunstown TEG was granted a license for the combustion of fuels in installations with a total rated thermal input of 50 MW or more on the 14th of September 2023 (P1194-01). Non-compliance issues regarding lands, soil or geology were not noted, therefore this site shows no reason to produce adverse environmental impacts upon the subject site.

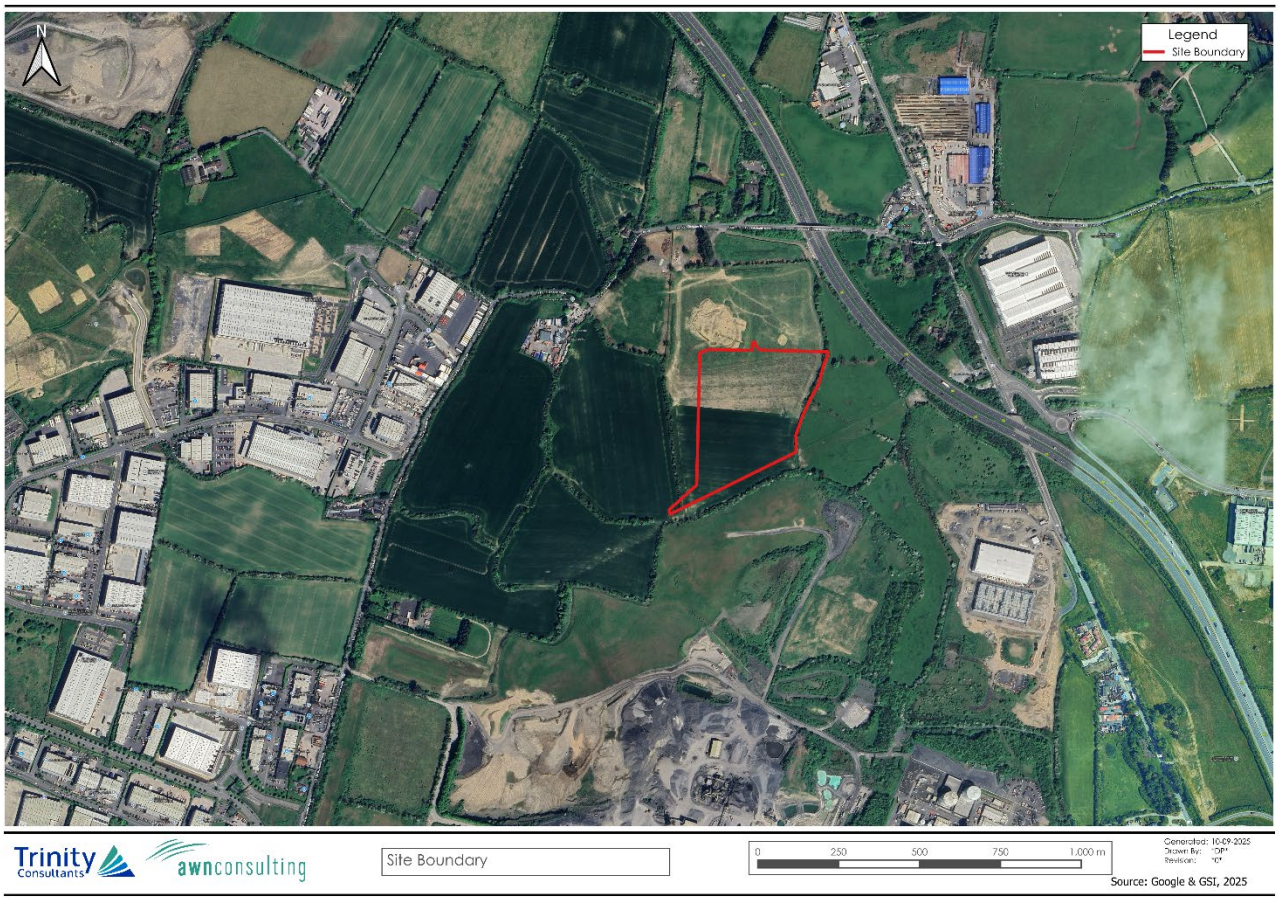
Huntstown quarry is a licensed inert waste recovery facility operating under license number W0277-03 issued in 2015. From a review of the Annual Environmental Reports and Licensee Reports related to the activities at the Huntstown Power Station and Huntstown Quarry on the EPA website a number of noncompliance issue were noted. However, there is no indication that these would result in adverse environmental impact on the subject site as it is located downgradient and therefore there would no effects on soils or groundwater underlying the subject site due to its operation.

Consultation with Fingal County Council have confirmed that there are no known illegal/historic landfills within 500 metres of the site. Historical Ordnance Survey maps were examined for the purpose of this assessment. O.S. maps were available from 1830 (the historic 6" maps) and 1900 from the historic 25"

maps. The historic maps indicate that the subject site was greenfield up to the present. No evidence was noted to indicate commercial or industrial processes have been undertaken on the subject site. The subject site appears to be used for agricultural purposes possibly grazing, cropping, storing cattle.

According to historical maps and aerial photographs this land use has not changed from 1830 to present. However, the associated building structures currently occupying the northwest corner of the site are absent from the 1830 and 1900 historical maps, suggesting these structures were established sometime between then and when they are first displayed in the 1995 aerial photograph.

Figure 5.1 Site Boundary

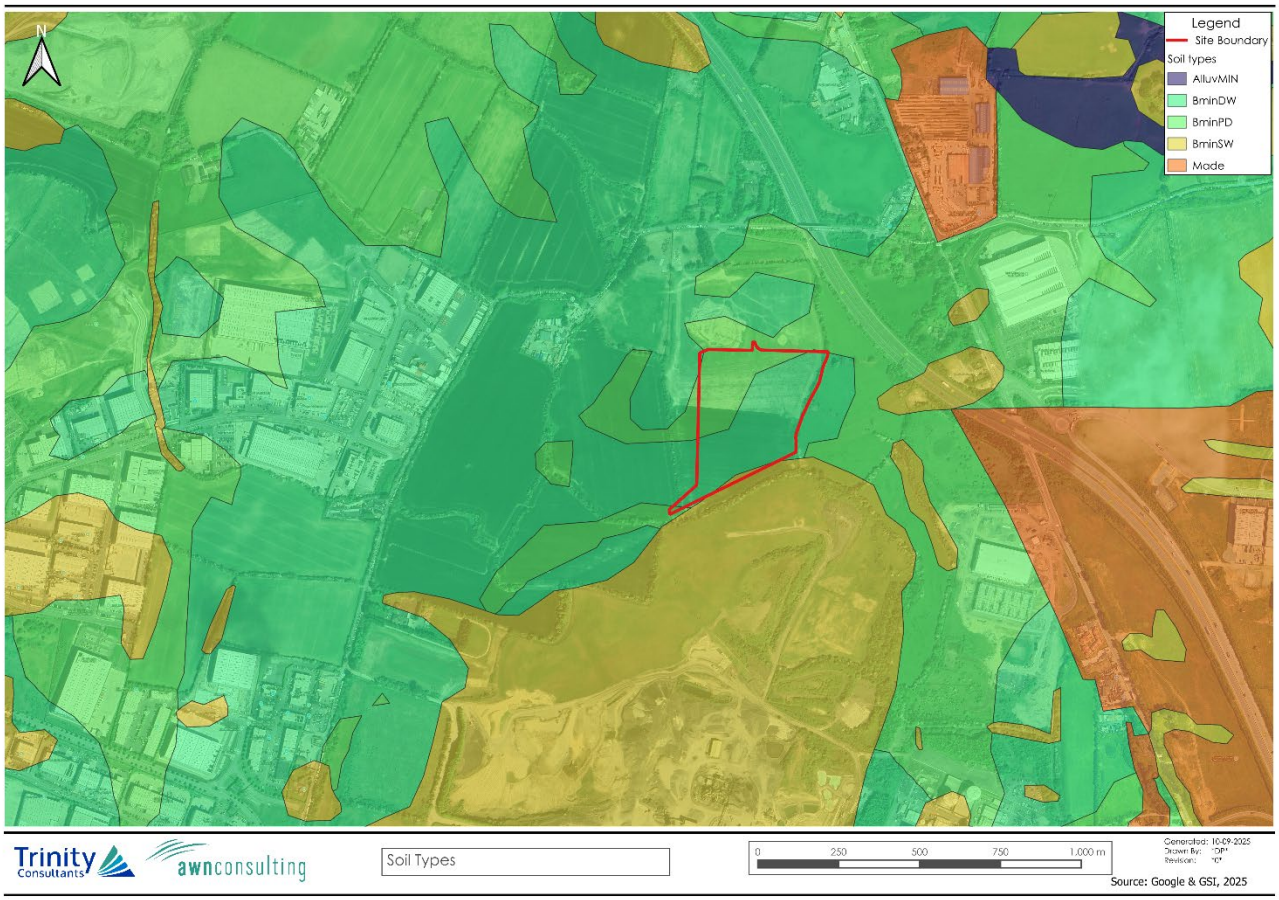


5.3.2 Soils and Subsoils

The GSI/ Tegasc mapping shows that the soil type beneath the local area is composed predominantly of BminPD mainly basic poorly drained soils coupled with BMinDW mainly basic deep well-drained mineral soils as presented in Figure 5.2 below. BminSW mainly basic shallow well drained soils is found in lesser abundance in the vicinity of the subject site.

A ground investigation undertaken by Site Investigation Ltd. (2021) reported the ground conditions to be consistent with cohesive brown and brown grey slightly sandy slightly gravelly silty CLAY with occasional black CLAYs encountered. Additional information regarding soil investigations are available at section 5.3.8.

Figure 5.2 Soils Map



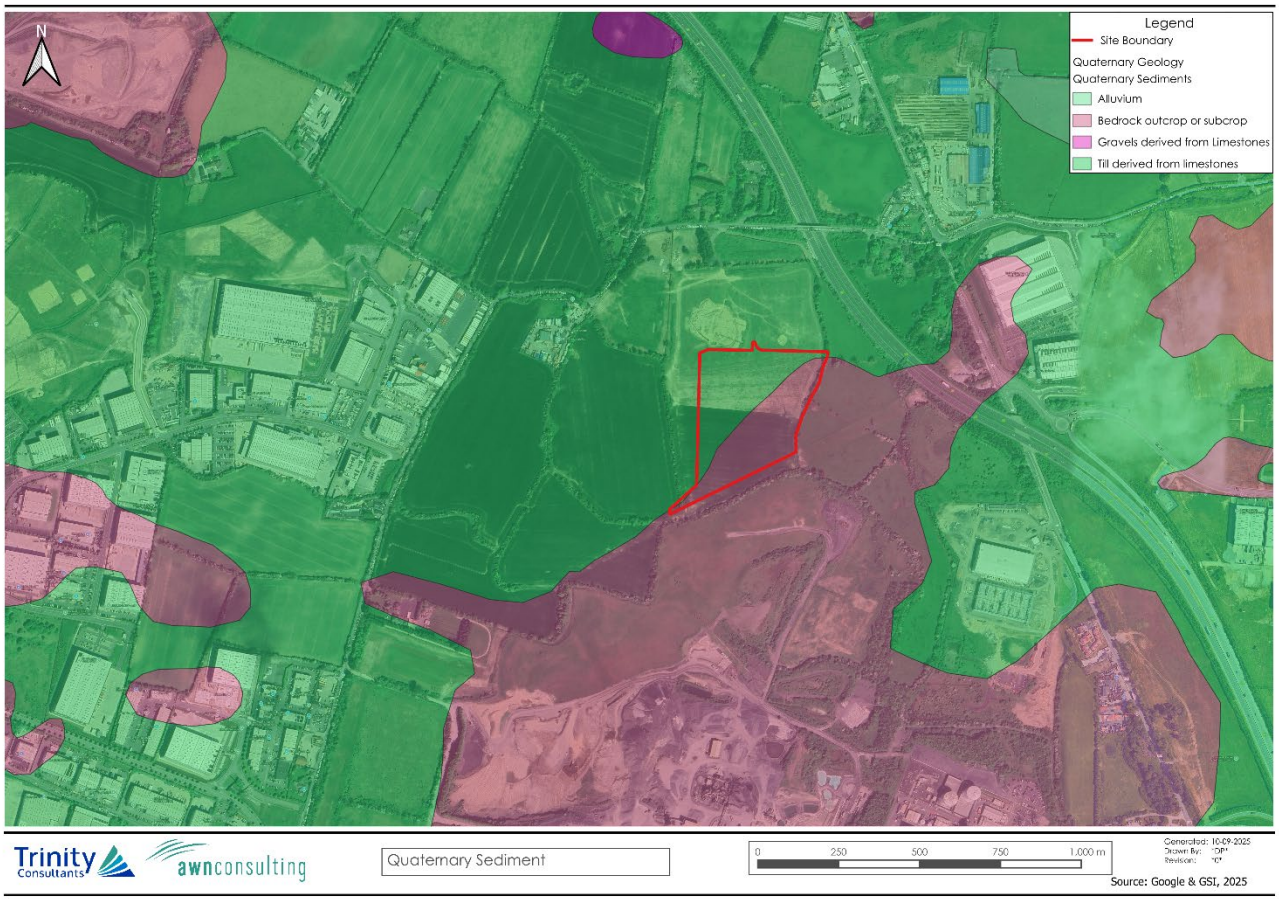
The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc mapping database of the subsoils in the area of the subject site indicates one principal soil type, as shown in Figure 5.3 below. The quaternary subsoil type present across the site is:

- LIMESTONE till Carboniferous (TLs). The north portion of the subject site is composed primarily of TILL derived from limestone. This till is made up of glacial CLAYs which are less permeable than alluvium subsoils.
- Bedrock OUTCROP or shallow underlying SUBCROP. The southern portion of the site is dominated by a combination of bedrock outcrop and shallow buried subcrop according to the GSI mapping.

The EPA soil mapping indicates that the soils comprise primarily of Carboniferous limestone diamictons (tills). The EPA have classed this area as non-irrigated agricultural land with arable farming function while the east portion of the site is characterised by a complex cultivation patterns. The southern end of the site lies within the boundary of previous mineral extraction sites.

Figure 5.3 Quaternary Sediment



As mentioned above, site investigations were undertaken in 2021 within the site boundary and adjacent lands to establish the shallow soil and water conditions. Five trial pits were excavated within the site boundary (referenced TP09, TP10, TP11, TP14 and TP16). Three boreholes (referenced BH02, BH03, BH04) were drilled using a rotary rig to a depth between 6.30 mbgl and 6.70 mbgl. Water strikes are detailed in the trial pit and borehole logs. The soil profile encountered can be summarised accordingly as follows:

- Topsoil: From ground level up to 0.2-0.3 mbgl.
- Subsoil: Cohesive Deposits (sandy gravelly Clay) underlie topsoil up to depths of 1.5-3.7 mbgl.
- Weathered Limestone Bedrock/ Bedrock was encountered below subsoil.

This profile encountered at the site is considered to be representative for characterising the site in question. Refer to Figure 5.5 below for locations of trial pits and boreholes. Trial pit and borehole logs from the above investigation can be viewed in the preliminary construction environmental management plan.

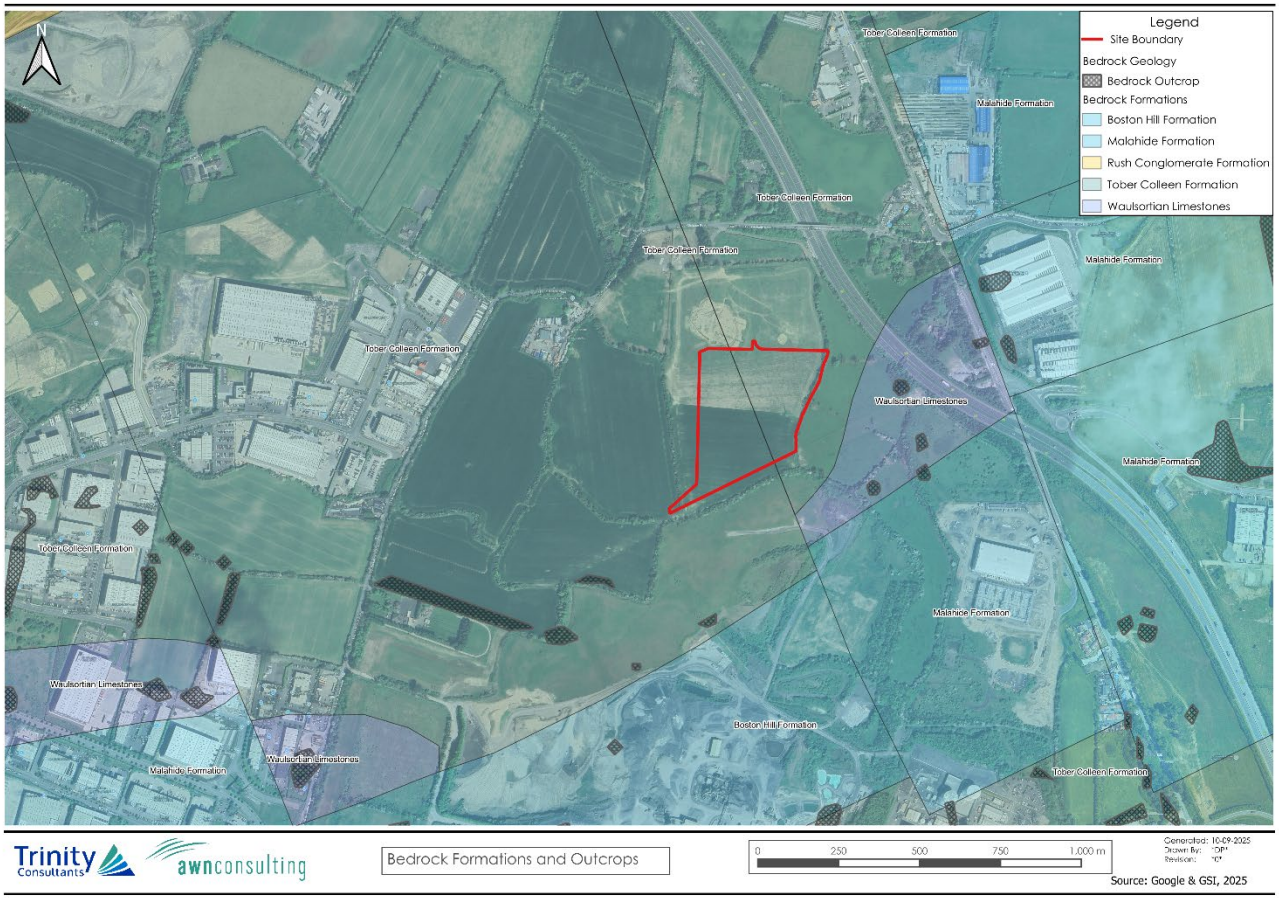
5.3.3 Bedrock Geology

Inspection of the available GSI (2025 records (Data Sheet 16 and on-line mapping database) shows that the bedrock geology of the site and the surrounding area is dominated by Calcareous shale and limestone conglomerates referred to as part of the Tober Colleen Formation (Rock Unit code: CDTOBE). Massive unbedded lime mudstone associated with the Waulsortian Limestones Formation (CDWAUL) are found underlying immediately southeast/east of the site. (Refer to Figure 5.4 below).

The regional area is highly geologically variable. GSI maps do show the site as overlying the Tober Colleen formation which is bordered to the south east by Waulsortian Limestones (which have been noted to underly the Tober Colleen), further to the south and east by the Boston Hill Formation, to the north east by the Rush Conglomerate Formation. Due to this variability the GSI (2025 bedrock geology map (100K structural database) indicates a number of faults in the study area, one of which passing/transverse through the site with a north-south orientation.

According to the rotary cores drilled in the subject site, the encountered bedrock can be classified as weak to moderately strong Calcareous Mudstone interbedded with moderately strong argillaceous limestone characterised by slight weathering.

Figure 5.4 Bedrock Formations and Outcrops



Site investigations indicate bedrock depth immediately south of the site (while within the same agricultural plot of land) were recorded as ranging from 3.3-3.7 mbgl, while intrusive investigations within the site boundary were terminated at shallower depths subsequently encountering no bedrock, with the exception of trial pits TP05, TP06, TP08, TP11 and TP13 which encountered obstructions (possible bedrock) at depths ranging from 1.5-2.7 mbgl.

5.3.4 Geological Heritage Areas

The Geological Survey of Ireland (GSI) Public Viewer (www.gsi.ie/mapping) was reviewed to identify sites of geological heritage for the site and surrounding area. The Huntstown Quarry (Site Code DF022) to the south is the closest audited site. The Phoenix Park and Glasnevin Cemetery are located approximately 5.5 and 6.1 km to the south and south east of the site respectively.

5.3.5 Economic Geology

The GSI (2022) mineral database was consulted to determine whether there were any mineral sites in the area of the subject site. As stated, the Huntstown Quarry is adjacent to the subject site (c. 200 m to the south) and is an active limestone quarry. There are additional limestone deposits to the south east and south west of the site.

5.3.6 Karst Landforms

Karst is a landscape with distinctive hydrology and landforms that arise when the underlying rock is soluble. Although karst can develop on evaporate rocks such as gypsum and siliceous rocks such as quartzite, the vast majority of karst landforms are found on carbonate rocks, such as limestones. Karst landscapes may have sinkholes, caves, enclosed depressions, disappearing streams, springs and sinkholes.

No karst landforms have been identified within the site boundary or in the vicinity of the Proposed Development and would not be expected within this geology.

5.3.7 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating 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 and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and the landslide in closest proximity to the Proposed Development was approximately 7 km to the south west of the site, referred to as the M3 J4 Clonee 2014 which occurred on 3rd February 2014. There have been no recorded landslide events at the site. Due to the generally flat/level 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. 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 ~50 km to the south in the Wicklow Mountains. 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.

5.3.8 Historical Site Investigations and Soil Quality

Site investigations were carried out by Site Investigation Ltd in 2021 throughout the Kilshane site. These investigations included the following:

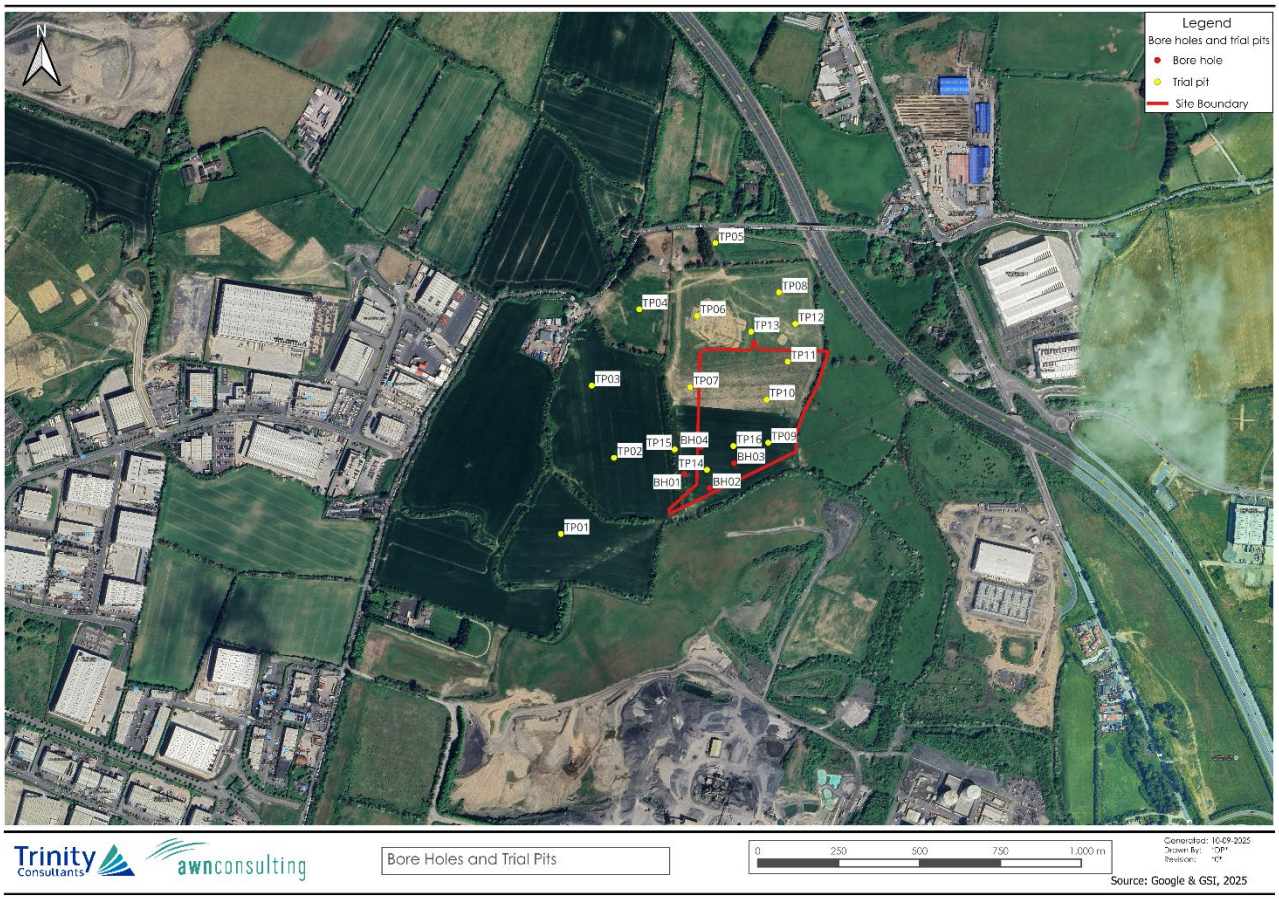
- Excavation of sixteen trial pits with dynamic probes across the large site area to examine soil conditions and if any infill or foreign material is present across the land (TP; depths up to 3.1 mbgl);
- Drilling of four. Cable Percussion Boreholes followed by rotary coreholes (depths up to 6.7 mbgl).
- Eight (8) no. environmental testing was completed for a Waste Classification.

Trial pit and borehole logs are included in the preliminary construction environmental management plan, which include a description of the lithologies observed in each excavation, depth to bedrock, type of bedrock and any water strikes encountered during the excavations.

Samples were collected from the arisings from all of the trial pits, which were considered representative of the material observed at the selected sampling location and were transferred directly into laboratory-supplied containers. The containers were then clearly labelled to identify the sample location and depth. Standard sampling techniques were used to collect the samples, which are designed to reduce the risk of cross contamination between sampling events. The preliminary construction environmental management plan presents tables with the soil analytical test results. The full analytical laboratory reports are presented in the preliminary construction environmental management plan. The locations of trial pits and boreholes from which representative samples were collected are presented in Figure 5.5 below.

IT is necessary to note that the due to the change of the proposed sites boundaries some of the borehole and trial pits lie outside of the current proposed boundary, for the sake of completeness all boreholes and trial pit locations have been included.

Figure 5.5 Boreholes and Trial Pits



There are no legislated threshold values for soils in Ireland. As such soil samples were compared to a Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and also ecology for a resident and commercial/industrial end use.

GAC in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for a number of different land uses. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. A total of 82 substances including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious

"trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content.

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 and have been used in that capacity for this assessment.

In total, 11 no. soil samples were collected throughout the trial pitting exercise at the data centre site and analysed for a range of parameters to examine the soil quality and to investigate any present and/or past contamination occurred across the site. Full laboratory result tables for the soil samples are presented in the preliminary construction environmental management plan.

The soil samples were analysed by ALS Life Sciences LTD, UK for the following parameters:

- Metals (As, Cd, Cr, Pb, Se, Cu, Ni, and Zn);
- Polychlorinated Biphenyls (PCB);
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Waste Acceptance Criteria (WAC) for inert waste landfills in accordance with the 2002 European Landfill Directive (2002/33/EC). This suite of parameters includes the following (carried out on 5 samples including 2 from onsite stockpiles);
- Mineral oil;
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- BTEX compounds (benzene, toluene, ethylbenzene and xylenes) and methyl tert-butyl ether (MTBE);
- Total organic carbon (TOC); and
- Leachable component of a range of organic and inorganic parameters.

The full analytical laboratory report is presented in the preliminary construction environmental management plan. For this EIAR the soil results were compared to the GAC concentrations. GACs are soil concentrations that have been derived for a defined set of generic assumptions and are used as trigger values in determining whether further risk management action is required in cases where detailed quantitative risk assessment is not being undertaken.

- Metals
  - All metal parameter concentrations recorded values below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 1% SOM.
  - Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG)
  - All parameters recorded below the laboratory's limit of detection (LOD) for all soil samples collected across the site. Therefore, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e. LQM/CIEH for HHRA Residential Threshold at 1% SOM.
- PCBs
  - All parameters recorded below the laboratory's LOD for all samples collected across the site.
- PAHs
  - All parameters recorded below the laboratory's LOD for all samples collected across the site. Therefore, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e. LQM/CIEH for HHRA Residential Threshold at 1% SOM.
- Waste Acceptance Criteria (WAC) Analysis

- Of the 11 no. samples taken, 8 no. samples were analysed and compared against Waste Acceptance Criteria (WAC) set out by the adopted EU Council Decision 2003/33/EC which established criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). There was no fill material noted during trial pit excavations with all samples being recorded as original clay subsoil.

The WAC analysis identifies that the representative sample is suitable for classification as Category A – Inert. Based on the laboratory results and parametric concentrations obtained from the site investigation, material from the sample locations would be acceptable at inert waste facilities (Category A). It should be noted that waste facilities develop facility specific criteria also and this should be considered should any soil/ material to be removed from site in the future. The comparison tables for the analysed samples against current WAC criteria can be seen in the preliminary construction environmental management plan.

5.3.9 Rating of Importance of Geological Features

Based on the TII methodology (2009) criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as 'High importance' with high significance or value on a local scale. This is due to the existence of an existing quarry in the immediate vicinity of the subject site (Huntstown Quarry) which is located c. 0.2 km to the south of the site.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package.

The Proposed Development will be a continuation of the Permitted Development of reference FW22A/0204, not yet in construction, which will comprise the construction of a Gas Turbine Power Generation Station.

For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 'Description of the Proposed Development' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

5.4.1 Construction Phase

The construction phase of the Proposed Development represents the greatest risk of potential impact on the land, soils and geological environment.

5.4.1.1 Removal of soils/subsoils

Over the course of the site's development soil and subsoil will be removed due to site clearance, levelling and excavating. The estimated total cut volume is ca. 54857 m³, 8,100 m³ of topsoil and about 46,757 m³ of subsoil are expected to be stripped during site preparation.

5.4.1.2 Storage of soils/aggregates

Following the proper implementation of the construction environmental management plan topsoils and subsoils will be kept separate from other construction materials. In the case of topsoils, they should be protected from vehicles and stored in piles no higher than 2 meters to maintain the integrity of the soil matrix. Topsoil should also be kept dry and used as soon as possible. Subsoils should be kept separate and, if deemed suitable, used for landscaping and non-engineering fills on site. Aggregates such as sands and gravels will be stored in clearly marked, designated receptacles/areas within a secure area in the construction compound to prevent contamination.

5.4.1.3 Storage of excavated hazardous material

The storage of excavated hazardous material will be kept separate from other non-hazardous wastes to prevent contamination. It is not expected that the movement of hazardous waste from the site will be necessary; in the event that excavated hazardous material does need to be removed from the site, arrangements will be made with the relevant authority.

5.4.1.4 Import/Export of Materials

Minimising the amount of imported material for the site, excavated soil and subsoil will be reused where deemed appropriate on site. If the need to export soil arises, chemical testing to determine waste classification will be carried out. Should the soil be found to be hazardous, pretreatment of the soil will be carried out before being sent to the receiving landfill.

5.4.2 Operational Phase

The Proposed Development characteristics which relate to the land soils and geological environment during operation are summarised below.

The Proposed Development will result in an increase in hardstanding, from both the proposed buildings and access roads. The Proposed Development will also result in the loss of agricultural land.

5.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential effects of the Proposed Development on the land, soils and geological environment during the construction and operation phases is outlined below. Mitigation measures included in the design of this project to address these potential impacts are presented in Section 5.5 below.

5.5.1 Construction Phase

In the absence of mitigation, the following potential effects to land, soil and geology have been considered for the construction phase.

5.5.1.1 Excavation and Infilling

Due to the lack of previous development at the site and the historical residential and agricultural use at the site, the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. Nonetheless, material, which is exported from the site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

The levelling of ground and excavation for foundations will require the excavation of topsoil, subsoil and bedrock, as the depth of bedrock ranges 1.5-3.7 mbgl. The maximum excavation level would be c. 9.05 mbgl.

It has been estimated that 63,856 m^3 of excavated material will be generated (comprising 10,200 m^3 of topsoil and 53,656 m^3 of other material). All this excavated material will be reused on site for landscaping of the berms. Import of fill is not expected to be required.

Site investigation and laboratory analysis has not identified any existing contamination. However, if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor.

The deepest proposed excavation is approximately 3.9 mbgl. Therefore, groundwater ingress can be expected. However, this groundwater volume would be minor given the ground condition of relatively impermeable clay overlying rock. As inflow rates are expected to be low, there will be a localised zone of contribution which will not likely extend beyond the site boundary.

It is expected during the excavation works that localised dewatering of the subsoils will be required to address perched groundwater. It can be expected that minor ingress of rainfall in the excavation to occur during construction phase.

In the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term***, ***slight*** and ***negative***. The effect is considered to be 'slight' due to the fact that there will not be intervention on the geological regime on a local or regional scale.

5.5.1.2 Accidental Spills 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 temporary risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer.

During construction of the development, there is a risk of accidental pollution incidents from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Accidental spillages, which are not mitigated may result in localised contamination of soils and groundwater underlying the site, should contaminants migrate through the subsoils and impact the underlying groundwater. Groundwater vulnerability at the site is currently classified as extreme, high, and moderate in the south, central portion, and north of the site, respectively. Any soil stripping will also further reduce the thickness of the subsoil and the natural protection they provide to the underlying aquifer.

In the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, slight*** and ***negative***. The effect is considered to be 'slight' due to the fact that there will not be intervention on the geological regime on a local or regional scale.

5.5.1.3 Loss of Agricultural Land

There will be local loss of agricultural soil however the area of development is small in the context of the overall agricultural land available in the region. The majority of the land is zoned for development. Within the overall context of Ireland's available farmland, the loss is negligible. There will be no impact to mineral resources in the area as a result of the Proposed Development.

5.5.2 Operational Phase

The development does not include the storage and use of fuel oil. The reserve fuel for the turbine will be diesel fuel oil, which will be stored in a dual-containment tank with a capacity of 27,430 m^3 in the permitted site

Any accidental spills of chemicals during storage, transfer, or delivery or leakage in the car parks could cause localised contamination if the emissions enter the soil and groundwater environment without adequate mitigation. However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed and any releases to drainage will be mitigated through a Class 1 Petrol interceptor which is proposed to be installed before surface water outfalls to the existing ditch system (refer to Chapter 8 for further details).

There will be an increase in hardstand as a result of the development of the facilities of c. 20,310m^2. Incorporation of hard stand area on a previous greenfield area and the use of SUDs techniques will have a minor effect on local recharge to the ground; however, the impact on the overall groundwater regime will be insignificant considering the proportion of the site area in relation to the total aquifer.

In the absence of mitigation, the effect on the geological environment is likely to be ***long-term, slight*** and ***negative***. The effect is considered to be 'slight' because there will not be intervention on the geological regime on a local or regional scale.

5.5.3 Do Nothing Scenario

If the Proposed Development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no, excavation or construction at this site. There would, therefore, be a neutral effect on the environment in terms of waste.

The site is zoned for development, and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national and regional

policies and therefore the likely significant effects would be similar to this proposal. A potential increase in hardstanding areas would result in local changes to recharge and hydrological flow patterns.

5.6 Mitigation Measures

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

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

5.6.1 Construction Phase

5.6.1.1 Construction Environmental Management Plan

In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the Proposed Development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the Proposed Development.

As a minimum, the CEMP will be 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.

In order to reduce impacts on the soil and geological environment, a number of mitigation measures will be adopted as part of the construction works on site as outlined below.

5.6.1.2 Control of Soil Excavation

Site preparation, excavations and levelling works required to facilitate construction of foundations, access roads and the installation of services will require imported material. Suitable soils will be reused on site as backfill in the grassed areas, where possible. Contractors shall be required to submit and adhere to a method statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

According to onsite investigations, the bedrock vulnerability is 'Extreme'. However, removal and reinstatement of subsoil cover will not alter the vulnerability category of the underlying bedrock. The deposition of infill soil would increase the overburden thickness and thus may even decrease the groundwater vulnerability.

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

Although there is no evidence of historical contamination in the Proposed Development area, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Site investigations classified the subsoils as 'inert'. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order 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 disposed of by a licensed waste disposal contractor.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any surface water body. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.

5.6.1.3 Fuel and Chemical Handling

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site) which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

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

In the case of drummed fuel or other chemical which may be used during construction, containers will be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

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.

5.6.2 Operational Phase

The kerbed unloading area is designed to contain leaks from the tanker truck and unloading station during tank fill operations and unloading station maintenance activities. The kerbed area will be monitored visually during the temporary manual operations. Rainwater collecting in the curbed area will be visually inspected before manual discharge to grade.

The design includes hardstand cover and permeable paving across the site prior to discharge into the attenuation system. Therefore, the risk of accidental discharge has been adequately addressed through design.

Petrol interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site (refer to Chapter 6 for further details). This together with hardstand cover and permeable paving will minimise the potential for any impact to the geological environment.

An Environmental Safety and Health Management System (EMS) will be implemented at the Proposed Development during operations. An environmental management plan will apply to the overall development during the operational phase incorporating mitigation measures and emergency response measures. An Emergency Response Plan has been developed for the proposed facility and has been included in the planning application. Section 7 and 8 for the ERP outline the procedures to be followed in response to a fire or spill.

There will be a comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. 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. Section 6 of the Emergency Response Plan outlines the training plan to be provided to site personnel. The Emergency Response Plan will be updated based on final as built design and layout prior to the operational phase.

5.7 Monitoring Measures

5.7.1 Construction Phase

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

5.7.2 Operational Phase

Visual monitoring of the kerbed area during tank filling operations and unloading activities to ensure hydrocarbons are not present before infiltration into the ground may occur.

Daily visual inspection will be undertaken by the contractor at the silt trap/ settlement tank to ensure adequate internal settlement is occurring. Where the visual assessment highlights elevated suspended sediments higher than expected, the water will be re-circulated for further settlement.

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors. Regular inspection of surface water run-off and any sediment control measures will be carried out during the construction phase.

5.8 Residual Impacts

5.8.1 Construction Phase

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the land, soils and geological environments do not occur during the construction phase and that the residual impact will be ***short-term-imperceptible-neutral***. Following the TII criteria (refer to the preliminary construction environmental management plan) for rating the magnitude and significance of impacts on the land, soils and geological related attributes, the magnitude of impact is considered ***negligible***.

5.8.2 Operational Phase

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the land, soils and geological environments do not occur during the operational phase and that the residual impact will be *long-term-imperceptible-neutral*. Following the TII criteria (refer to the preliminary construction environmental management plan) for rating the magnitude and significance of impacts on the land, soils and geological related attributes, the magnitude of impact is considered *negligible*.

5.9 Cumulative Impact

The following considers the cumulative impacts of the Proposed Development and proposed and permitted and operating facilities in the surrounding area in relation to land, soils and geology. This considers the Proposed Development and other surrounding proposed and permitted developments listed in the preliminary construction environmental management plan.

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.

There are eleven (11 no.) developments which potentially pose cumulative impacts that have been granted permission in the recent past whose impact (either in construction phase or operational phase) are not yet wholly realised within the existing land, soils and geological baseline environment. These cumulative developments are:

- PA06F.312131 - Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- FW24A/0400E - Huntstown Power Station, a Battery Energy Storage System facility to include up to 85 no. containerised battery storage modules on concrete bases, 20 no. transformer and power conditioning units, cable racks, and associated lighting. Associated development including internal access roads, security gates, palisade perimeter security fencing, acoustic barrier, site drainage and all other works required to facilitate the development. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- FW24A/0339E / PL06F.321196 - The demolition of two no. existing detached dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89) and associated garages and shed structures, and permission for the use of the subject site (c. 2.52 Ha) as a storage container depot
- FW21A/0151 / PL06F.313583 - Demolition of 2 no. existing residential dwellings and ancillary structures to the east of the site (c.344qm total floor area); Construction of 2 no. data hall buildings. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction phase only with respect to the land, soils and geological environment.
- VA06F.311528 - Lands adjacent to Huntstown Power Station, North Road, Finglas, Dublin 11. The development comprises a two-storey 220kV gas insulated switchgear (GIS) substation. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- VA06F.318677 - Within the townlands of Fieldstown, Clonmethan Electoral District, Co.Dublin. The development comprises a SID application for a 110kV Air Insulated Switchgear (AIS).

- FW22A/0204 / PL06F.317480 - Kilshane Road, Kilshane, Finglas, Dublin 11 (within Proposed Development site boundary). This development is referent to Kilshane Phase 1 and comprises the construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- VA06F.314894 - Lands at Kilshane Road, Kilshane, Finglas, Dublin 11 (within Proposed Development site boundary). Proposed Development of a 220kV Gas Insulated Switchgear (GIS) substation on lands at Kilshane Road, and an underground 220kV transmission line connection to the existing Cruiserath 220kV substation. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- FW22A/0213 - Newtown & Coldwinters, North Road, Fingal, Co. Dublin. The development is within a total site area of up to c. 1 ha. to include 1 no. DSO (Distribution System Operator) electrical substation building. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- FW22A/0066 - A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15. The Proposed Development consists of the construction of a high technology manufacturing unit. Applying the precautionary principle this granted planning permission has the potential to act cumulatively with the Proposed Development for the construction and operational phases with respect to the land soils and geological environment.
- FW20A/0219 - Newtown and Coldwinters, North Road, Co. Fingal. Permission for an amendment to the original planning permission, at this site, for a gas peaking facility with 10 no. containerised gas fired generating units, with an export capacity of 20 megawatts (MV) under planning reference FW19A/0090. This granted permission does not present any potential to act cumulatively with respect to the land, soils and geological environment.

The remainder of the planning permissions identified in the preliminary construction environmental management plan have no potential for cumulative effects with the Proposed Development in terms of the land, soils and geological environments, and or are already operational and as such are reflected in the current environmental baseline.

There are two closely related projects that are not part of the subject proposal but are integral to its operation. Although these are both subject to separate consent processes, they are both integral to the operation of the power station. These are:

- An Above Ground Installation (AGI) gas supply project - The AGI (Above Ground Installation) will regulate delivery of gas supply to the power station. It will be located within the subject lands and it will be connected to an existing nearby gas main by means of a new underground pipe. The pipe route has not yet been confirmed however Gas Networks Ireland have indicated a range of options. Depending on the route taken this will be approximately 600-700 m in length. Applying the precautionary principle this future related project has the potential to act cumulatively with the Proposed Development for the construction phase only with respect to the land soils and geology environments.
- Gas Insulated Switchgear (GIS) project - The location of the GIS electrical substation, which is required to convey generated electricity to the grid connection, is within the subject lands. The GIS will be connected to the national grid at Cruiserath substation to the west. The connection will be by means of a buried cable c. 4.69 km in length, generally laid under public roads. Applying the precautionary principle this future related project has the potential to act cumulatively with the Proposed Development for the construction phase only with respect to the land soils and geological environments.

In addition, the 2 additional turbines on the proposed site will require the installation of a 400kv connection. Design for the project has yet to be finalised, with preliminary designs suggesting the connection will follow the R135 in a North Westerly direction and terminates North of the village of Coolquay, co. Dublin.

5.9.1 Construction Phase

Applying the precautionary principle, a number of granted permissions that may well have completed their construction phase by the time the Proposed Development is undergoing construction have been included within this assessment of cumulative effects. In this regard it is assumed that there is potential for the construction phases of FW21A/0151, PA06F.312131, FW24A/0400E, FW24A/0339E, VA06F.311528, VA06F.318677, FW22A/0204, VA06F.314894, FW22A/0213, FW22A/0066, FW20A/0219, the AGI installation, GIS installation and 400kv interconnection to occur at the same time. In reality, such an occurrence is highly unlikely.

Contractors for both the Proposed Development and any simultaneous construction phase of the aforementioned 11 no. developments with granted permission, will be contractually required to operate in compliance with their CEMPs which includes the mitigation measures outlined in their respective EIA reports. The remaining developments (the AGI installation, the GIS installation and the 400kv interconnection) will be contractually obliged to operate in compliance with CEMPs which will be required by law to incorporate measures to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

Taking into account the relatively contained nature of the identified cumulative developments, the short-term aspect of their occurrence, the contractual controls, and the unlikelihood of them occurring in tandem, there will be minimal cumulative potential for change in soil quality.

The cumulative impact for the construction phase is considered to be *neutral* and *imperceptible*.

5.9.2 Operational Phase

With respect to the operational phase the following developments have the potential to act cumulatively with the Proposed Development with respect to the land, soils, and geological environments; FW21A/0151, PA06F.312131, FW24A/0400E, FW24A/0339E, VA06F.311528, VA06F.318677, FW22A/0204, VA06F.314894, FW22A/0213, FW22A/0066, FW20A/0219 the AGI installation, the GIS installation and the 400kv interconnection.

Operators for the projects mentioned above will be required to operate according to the conditions of their planning permission and in accordance with S.I. 272 of 2009 and S.I. 77 of 2019.

The operation of the Proposed Development during the operational phase is concluded to have a *long-term*, *imperceptible* significance with a *neutral* impact on soil and water quality.

Chapter 6 – Hydrology and Hydrogeology

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6. HYDROLOGY AND HYDROGEOLOGY

6.1 Introduction

This chapter of the EIAR evaluates the likely significant effects, if any, which the Proposed Development will have on the baseline hydrology (surface water) and hydrogeology (groundwater). 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.

The assessment also outlines the proposed design and mitigation measures that will reduce or eliminate the identified potential impacts and define the residual effects of the Proposed Overall Development (the effect after the implementation of mitigation measures).

This chapter should be read in conjunction with Chapter 5 (Land, Soils and Geology) and Chapter 7 (Biodiversity).

6.2 Methodology

This impact assessment was undertaken having regard to the following legislation and guidance:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).
- Guidelines for the preparation of Soils geology and Hydrogeology Chapters of Environmental Impact Statements (IGI 2013)
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII, 2009, previously NRA). The TII criteria for rating the hydrogeological and hydrological related attributes are presented in Appendix 6.1 and 6.2 of this EIAR.
- Environmental Impact Assessment Directive (as amended) (2011/92/EU & 2014/52EU)
- Water Framework Directive (WFD) 2000/60/EC.
- EU Directive on the Assessment and Management of Flood risks (2007/60/EC)

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation, regulations and guidelines. These include the following and have been considered in the assessment for this chapter.

- 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).
- 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.
- Water Services Guidelines for Planning Authorities Draft (Department of Housing, Planning and Local Government, 2018).
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);

- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2008); and
- Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

6.2.1 Criteria for rating effects

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

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The Zone of Influence (ZOI) is based on the potential for a source pathway linkage to a water receptor. This is determined by soil and bedrock characteristics, potential chemical loading/change to the regime (e.g. abstraction discharge/diversion of stream etc) and the connectivity to downgradient water receptors (wetland habitats, fishery, public water supply etc). These aspects are summarised in the Conceptual Site Model (below).

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

- Water Framework Directive (WFD) Status and potential for increased risk of deterioration of this status due to the activities of the site.
- River and aquifer water quality in the vicinity of the site (where available).
- Surface, transitional and coastal 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 and habitats within the area of the site.
- 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.

6.2.2 Sources of Information

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

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- 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)
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Engineering Assessment Report. Proposed Road Realignment and Gas Turbine Power Generation Station at Kilshane, Dublin 11. Waterman Moylan, June 2022;
- Site Investigation Report. Kilshane, Ballycoolin, Dublin 15. Site Investigation Ltd., December 2021;
- Various design site plans and drawings; and
- Consultation with site engineers.

6.3 The Receiving Environment

The Proposed Development site extends to over 5.22 ha. on lands adjacent to Kilshane road, N2 national carriageway, and Huntstown Quarry Dublin 11. The site is bounded to the north by Kilshane road, to the east by the N2 national carriageway, to the south and west by agricultural fields, while land further south (c. 0.2 km) is occupied by Huntstown Quarry.

6.3.1 Land Use, Topography and Site History

The subject site is currently a greenfield site, used for agricultural purposes. There is no existing surface water drainage network adjacent to or on-site. The site comprises multiple fields separated by hedgerows, and generally slopes from west to east. Surface water, rainfall, is generally percolated through the site via grass and soil. The topographic survey has confirmed that the internal and boundary hedgerows contain ditches which convey flow to the Huntstown Stream to the east of the site, during heavier rainfall events. These ditches only serve the subject site and the agricultural fields immediately to the west, located between the subject site and the Kilshane Road, and does not convey any upstream watercourse.

6.3.2 Hydrology

The subject site is located in the River Tolka WMU (Water Management Unit) within the former Eastern River Basin District (ERBD) (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

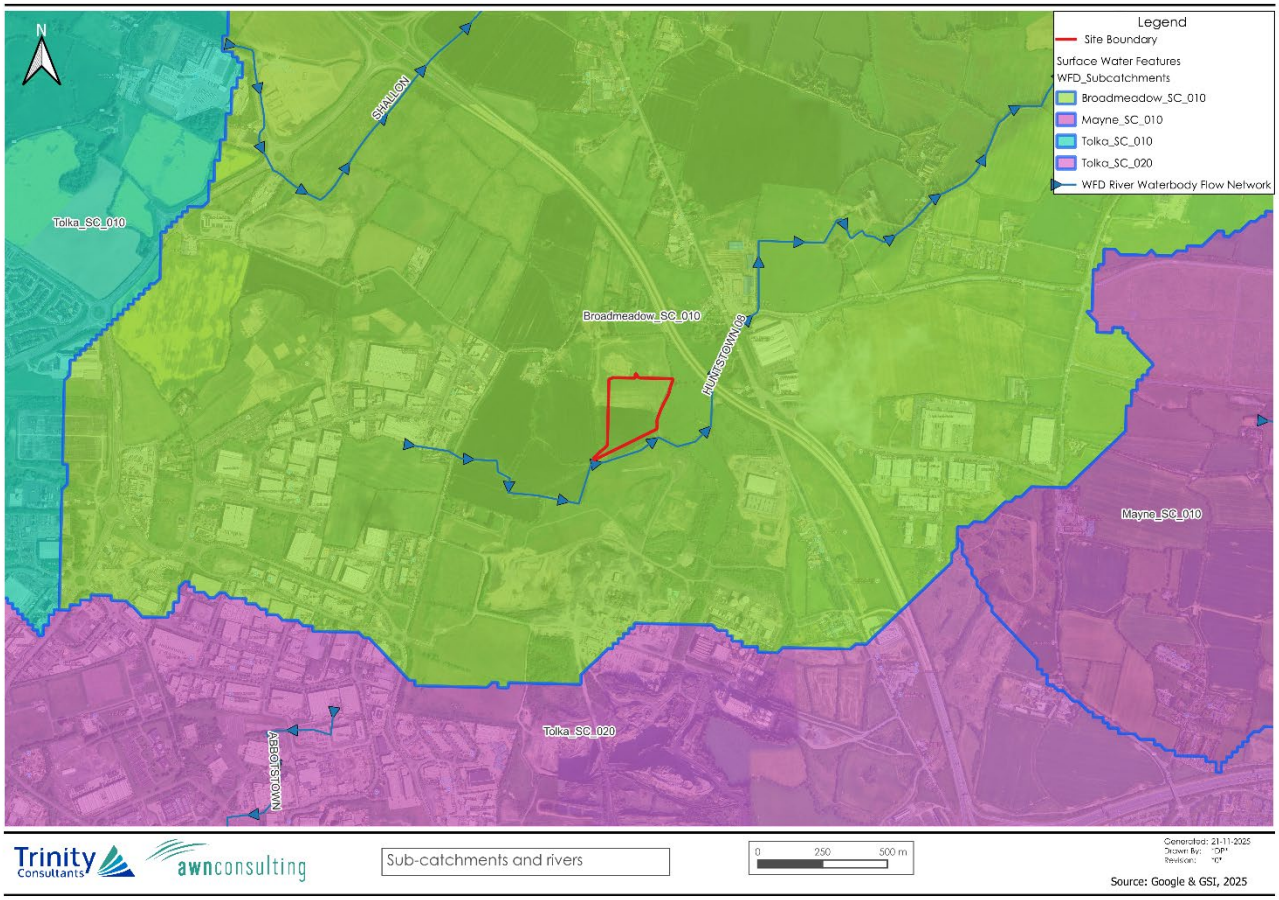
According to the EPA maps, the Proposed Development site lies within the Nanny-Delvin Catchment (Hydrometric Area 08) and the Broadmeadow sub-catchment (refer to Figure 6.1 below). The current EPA watercourse mapping does not include any existing streams within the subject site boundaries, a review of the historical mapping records provided within the GeoHive website do not indicate any watercourses within the site. During operation, after onsite attenuation, it is proposed to discharge surface water from the development to an unnamed drainage ditch at an approximate minimum distance of 125 m to the east of the site, which outfalls to the Huntstown Stream.

The Huntstown Stream generally flows in a north-easterly direction to join the River Ward approximately 4.4km to the Northeast of the site at St. Margaret's Golf and Country Club. The River Ward is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary. The hydrological

environment is presented in Figure 6.1 below. The Malahide Estuary (c. 9.6km downgradient) is a Special Protection Area (SPA), a candidate Special Area of Conservation (SAC), a proposed National Heritage Area (pNHA) and a RAMSAR site.

The proposed development lies within the Broadmeadows sub-catchment (WFD name: Broadmeadow_SC_010, Id 08_3) and would have a hydrological connection with the Malahide Estuary (SPA/SAC/pNHA) through the local drainage network, the Huntstown Stream and the Ward River.

Figure 6.1 Local Hydrological Environment (EPA, 2025)



6.3.2.1 Surface Water Quality

The Proposed Development is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 08 of the Irish River Network and is located within the Nanny-Delvin Catchment.

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

2015). The second cycle river basin management plan for Ireland took place between 2018-2021. The previous management districts were merged into one Ireland River Basin District (Ireland RBD).

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

The third cycle is currently under way and will run from 2022-2027.

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

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

According to EPA data, there are two historic inactive monitoring stations in close proximity to the subject site which have been previously decommissioned:

- Huntstown Stream Kilshane Br Ashbourne Rd' (EPA Code: RS08H020200): located immediately south of Kilshane Cross adjacent to the east boundary of North Road.
- 'Huntstown Stream- d/s Roadstone' (EPA Code: RS08H020100): located adjacent to the north boundary of Huntstown Quarry c. 0.2 km south of the site.

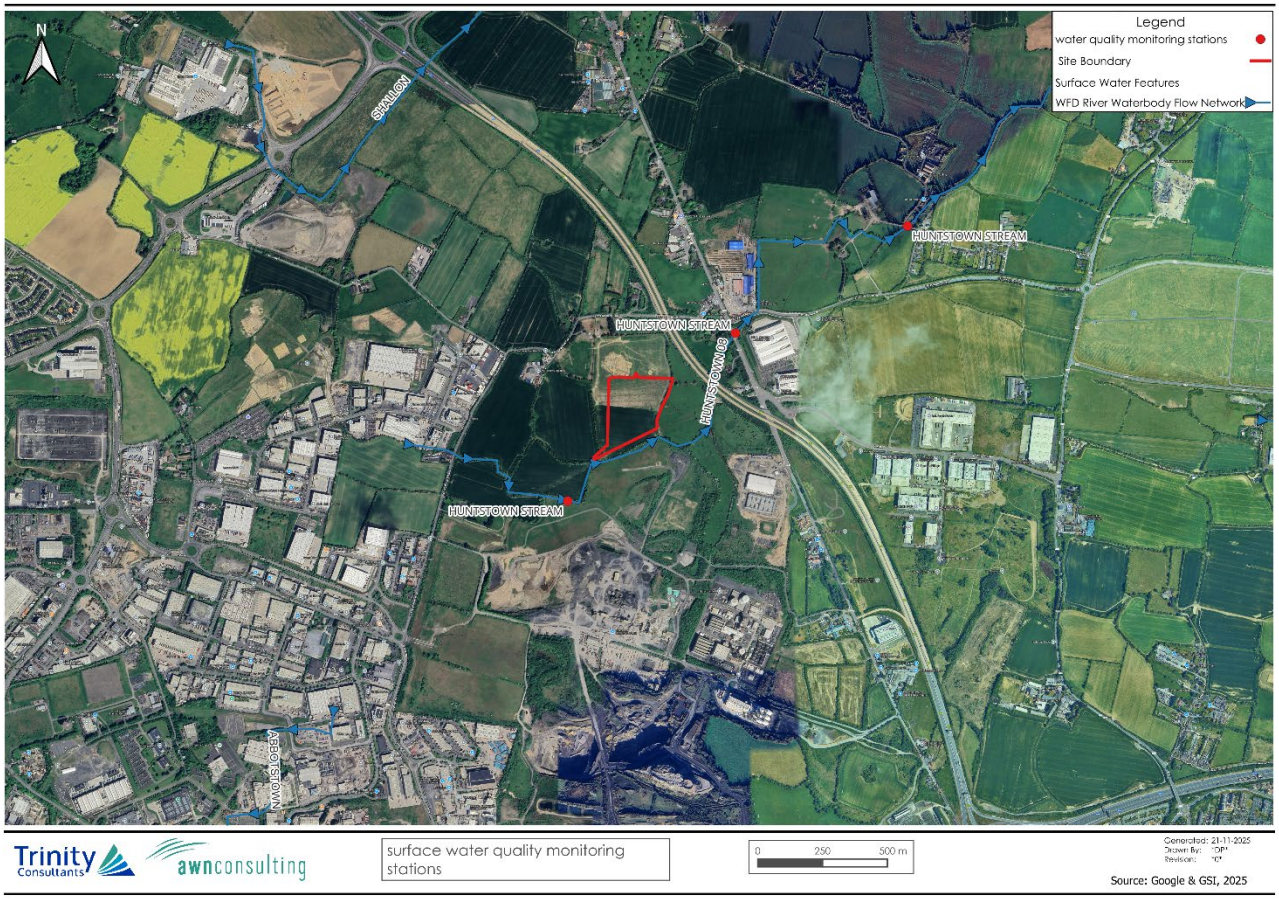
In relation to the subject site, the nearest active EPA monitoring stations located in the Ward River catchment are:

- 'Coolatrath Br' (EPA Code: RS08W010070): located in the Ward River c. 3.3km upstream of the Huntstown Stream. The most recent status recorded by the EPA (2024 is classified as Q3-4/Moderate.

- 'Br N of Killeek' (EPA Code: RS08W010300): located in the Ward River c. 1.2km downstream from its join with the Huntstown Stream. The most recent status recorded by the EPA (2024 is classified as Q3-4/Moderate.

Refer to Figure 6.2 below for locations of these EPA quality monitoring points in the context of the site.

Figure 6.2 EPA Surface Water Quality Monitoring Stations (EPA, 2025)



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. 'Good status' means both 'good ecological status' and 'good chemical status'.

The Huntstown Stream belongs to the Ward_030 WFD surface water body, which currently, the EPA classifies as having 'Moderate' and is 'At risk of not achieving good status'. This moderate status is related to the nitrogen (nitrate, specifically) and orthophosphate conditions measured in the Ward River.

6.3.2.2 Foul Water & Water Supply Network

The nearest Irish Water foul water network is located approx. 670m away on the R135 to the east of the N2 and is shown as the Kilshane Pump Station. Another foul network to the southwest of the subject site on the Mitchelstown Road has been identified. This network is a distance of 1.5km away from where the site boundary meets the Kilshane Road, at the entrance to Flaherty Logistics.

With regard to water supply, a 50.8 uPVC watermain is located to the north of the site on the Kilshane Road. The south of the site is traversed by a 914.4mm (36") concrete watermain. This distribution main is fenced-off as a protective measure.

In addition, there is an existing 110mm Ø MOPVC to the southwest of the site.

6.3.3 Flood Risk

According to the Flood Risk Assessment carried out by Waterman Moylan (2025), there is no risk of flooding affecting the site from fluvial or coastal sources, since the site lies within Flood Zone C (i.e., where the probability of flooding from rivers is less than 0.1% or 1 in 1000).

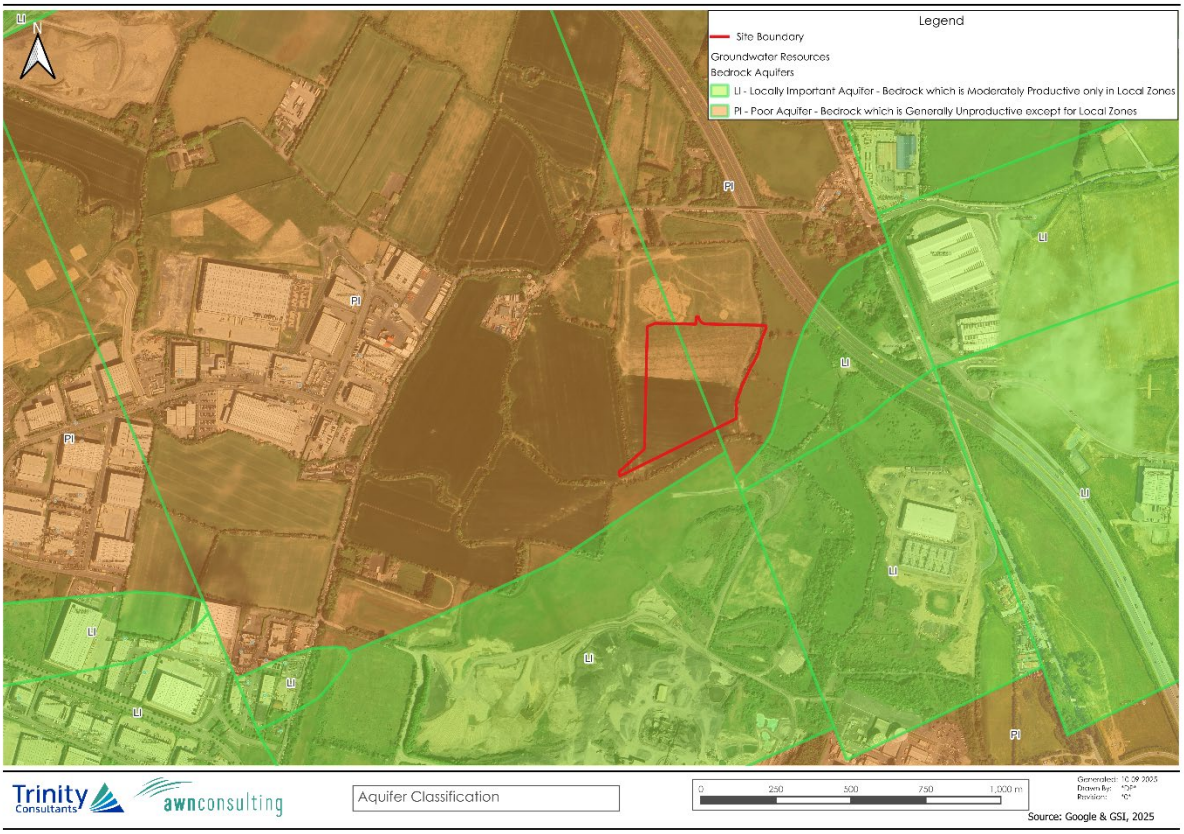
6.3.4 Hydrogeology

6.3.4.1 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 (km2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater transmissivity (mm3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

From analysis of GSI National data the bedrock aquifer underlying the study site is classified as Poor which is characterised as Generally Unproductive except for Local Zones. GSI mapping has shown a Locally Important Aquifer (LI) which is moderately productive only in Local Zones located in close proximity immediately south of the site (refer to Figure 6.3 below).

Figure 6.3 Aquifer Classification



6.3.4.2 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 currently displays/shows varied aquifer vulnerability across in the region. The approximate northwest half of the site overlies a 'High' vulnerable aquifer, while moving south east the vulnerability progresses to 'High' and 'Extreme' in the southeast portion of the site. As can be seen from 1 below an 'Extreme' vulnerability with clayey subsoil denotes a depth to bedrock of 0-3 mbgl with 'High' vulnerability categorised as 3-5 mbgl. The aquifer vulnerability class in the region of the site is presented below as Figure 6.4.

Figure 6.4 Aquifer Vulnerability

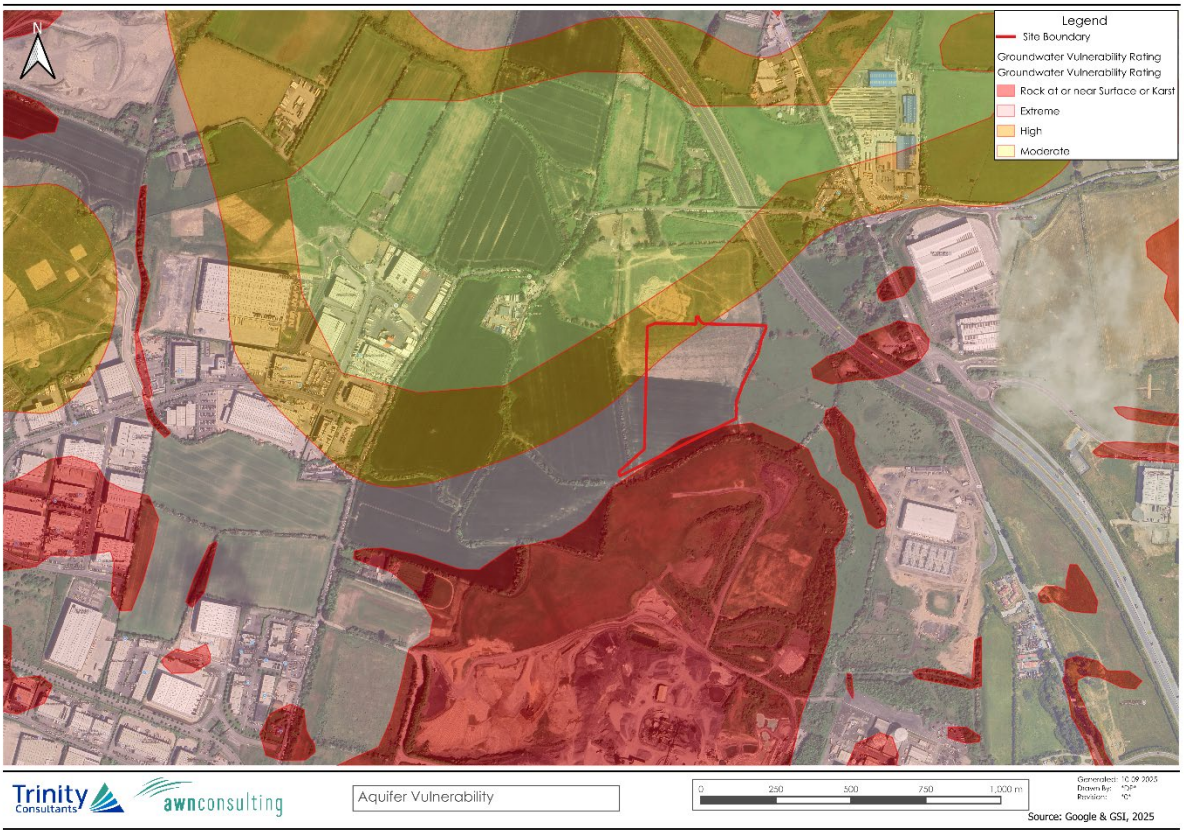


Table 6.1 Vulnerability Mapping Guidelines

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

Notes: (1) n/a: Not applicable
(2) Precises 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 Site Investigations Ltd. in 2021 confirmed that the depth to bedrock to the east in the study area ranges between 1.5-3.7 mbgl which is representative of an 'Extreme' groundwater vulnerability.

6.3.4.3 Groundwater Wells and Flow Direction

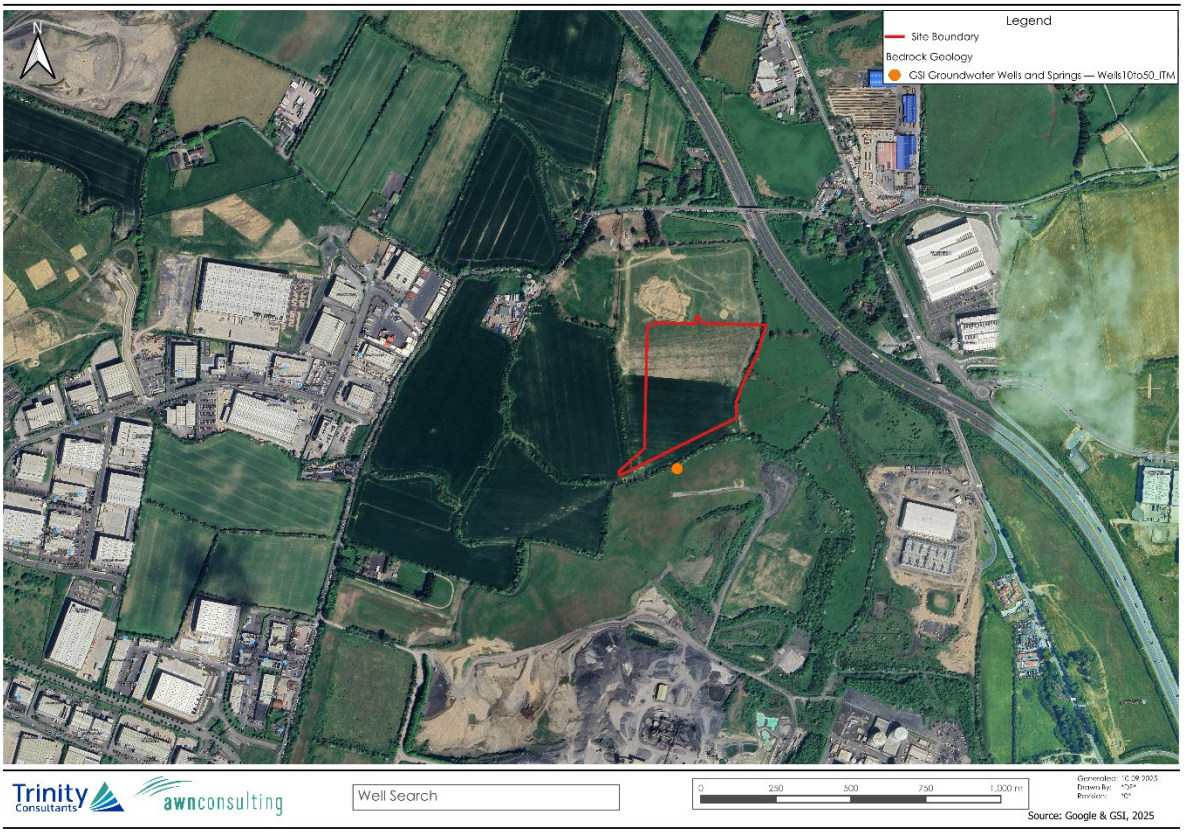
The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of all wells is not currently a

requirement in the Republic of Ireland. This current index does not show any wells drilled or springs at the site or in the immediate vicinity. The well in closest proximity to the site is located approximately 30 m to the south (Church Well). None of the wells is the surrounding area listed are categorised as domestic use. The area is serviced by Local Authority mains therefore it is unlikely that any wells are used for potable supply. The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site. The closest is approximately 10 km to the west (Dunboyne PWS) and the proposed site is outside of the zone of contribution of this supply.

Figure 6.5 below presents the GSI well search for the area surrounding the site (note this source does not include all wells). There are no details of this recorded well in the GSI Well Card Index.

Regional groundwater flow would most likely be to the south – southeast towards the River Tolka and Dublin Bay. However, it is understood that dewatering activates are taking place at Huntstown quarry and these will likely have a local influence on the groundwater flow at the subject site. In particular they will control any potential migration pathway from the quarry towards the subject site.

Figure 6.5 GSI Well Card Index



6.3.4.4 Groundwater 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. '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 River Basin Districts, 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 (Swords GWB) is classified under the WFD Risk Score system (EPA, 2025) as "not at risk". The Swords GWB was given a classification of "Good" for the most recent WFD cycle (2019-2024).

6.3.4.5 Rating of Importance of Hydrogeological Attributes

Based on the TII methodology (2009) the importance of the hydrogeological features at this site is rated as 'Medium importance' based on the assessment that the attribute has a medium – high quality significance or value on a local scale. The aquifer is a Poor Aquifer, is not widely used for public water supply or generally for potable use but has an adjacent quarry which is being dewatered. In addition, there are no groundwater dependent habitats of protected sites (SAC, SPA, NHA) within the zone of influence of the quarry

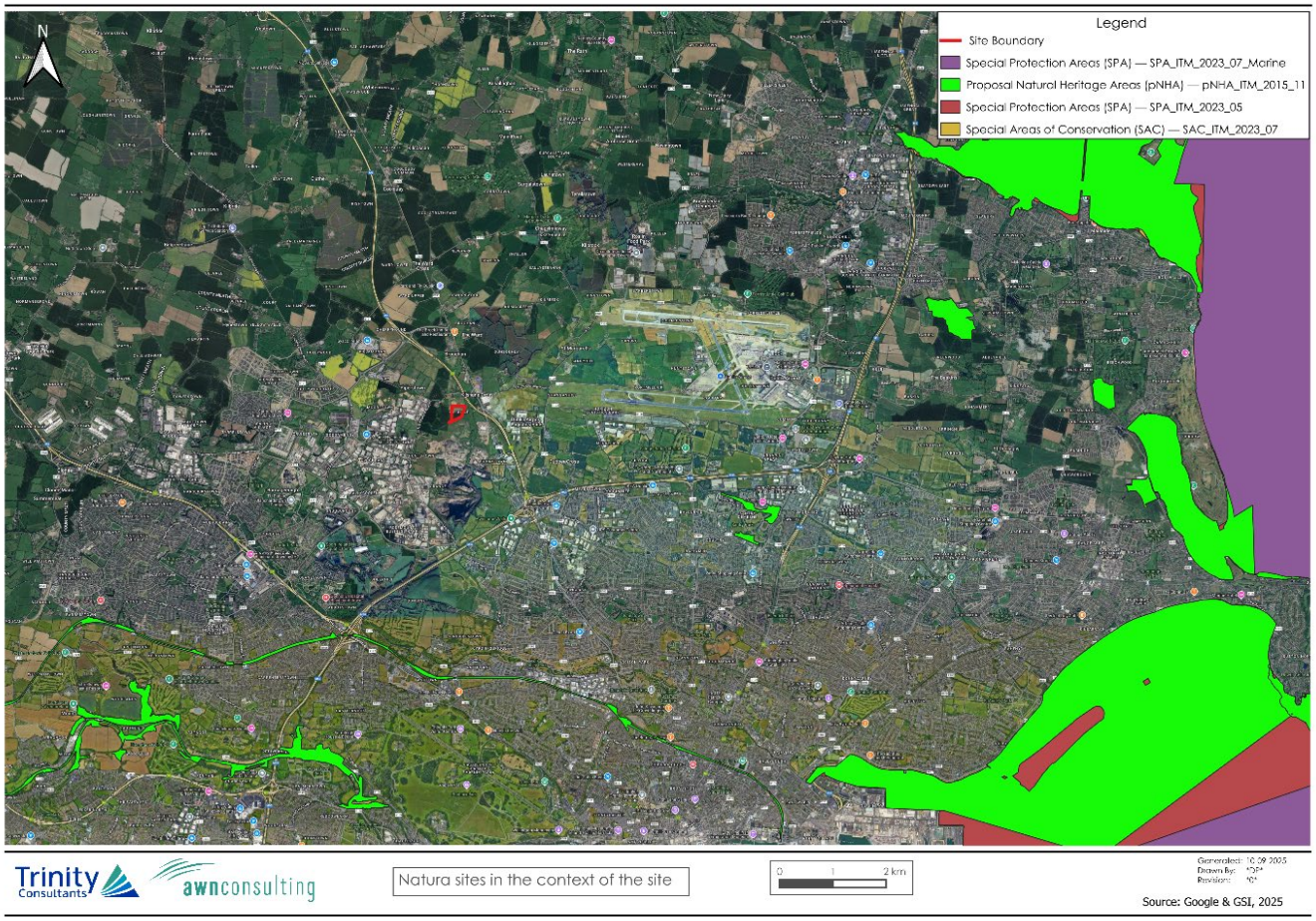
6.3.5 Areas of Conservation

According to the NPWS (2022) on-line database there are no special protected area on or in the vicinity of the subject site. The closest European listed sites are as follows:

- The Royal Canal (002103) pNHA - circa. 5.1 km to the south of the site.
- The Santry Demesne (00178) pNHA – circa 4.8 km to the east of the site

The site would have an indirect hydrological pathway or connection with the Malahide Estuary SPA/SAC/pNHA through the local drainage network, the Huntstown Stream and the Ward River. Figure 6.6 below presents the location of these protected areas in the context of the Huntstown site.

Figure 6.6 Areas of Conservation



6.3.6 Conceptual Site Model

The subsoil underlying the site is classified as glacial Tills (generally low permeable) by the GSI and the underlying limestone aquifer (Poor aquifer) has an 'Extreme' vulnerability based on site investigations carried out in 2021.

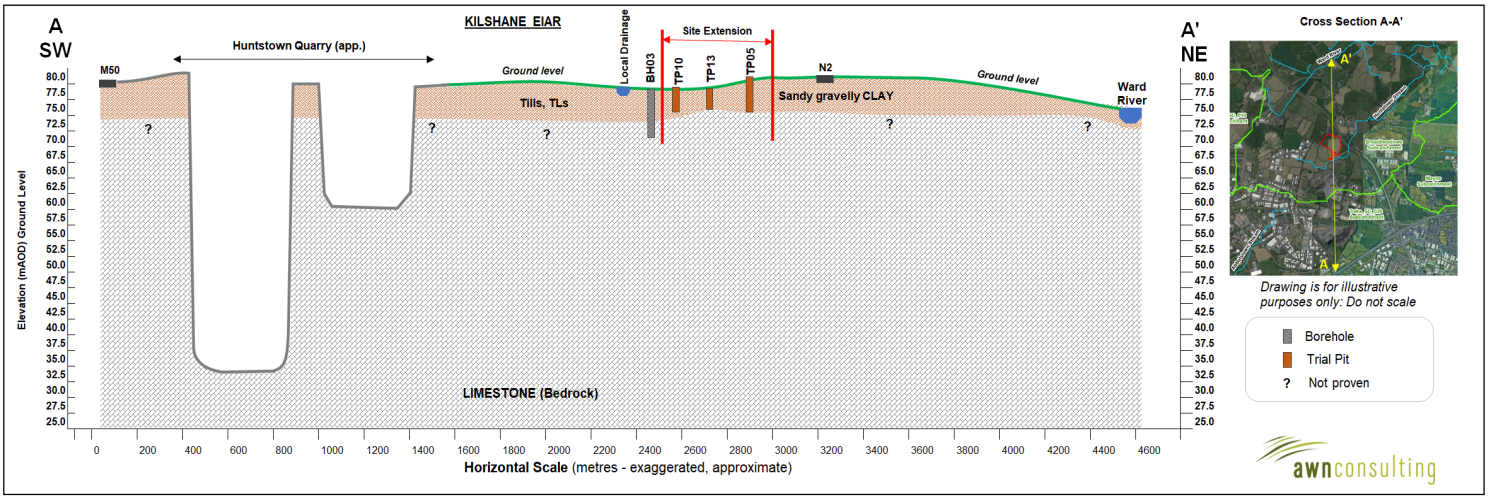
The soil profile encountered can be summarised as follows (based on location RC04):

- Topsoil: From ground level up to 0.2-0.3 mbgl.
- Subsoil: Cohesive Deposits (sandy gravelly Clay) underlie topsoil up to depths of 1.5-3.7 mbgl.
- Weathered Limestone Bedrock/ Bedrock was encountered below subsoil.

The site investigations carried out by Site Investigations Ltd. in 2021 confirmed that the depth to bedrock to the east in the study area ranges between 1.5-3.7 mbgl which is representative of an 'Extreme' groundwater vulnerability.

Review of the hydrogeology and geology in the surrounding region indicates that there are no sensitive receptors such as groundwater-fed wetlands, Council Water Supplies/ Group Water Schemes or geological heritage sites which could be impacted by this development. No evidence of disposal of waste material was identified the location area proposed for excavation. Collection and analysis of representative soil and groundwater samples for a wide range of parameters shows no evidence of contamination. The review of the groundwater quality data collected on site found that the groundwater beneath the site is of good quality. A regional cross section can be seen in Figure 6.7 below.

Figure 6.7 Regional Cross Section



6.4 Characteristics of the Proposed Development

The Proposed Development site is located on a 5.22 ha site in the townland of Kilshane, and Piperstown, Kilshane Road, Dublin 11. The Proposed Development will consist of the construction of two additional Gas Turbines and associated infrastructure at the permitted Kilshane Gas Turbine Power Generation Station. As per the site notice, the Proposed Development will consist of; 2 additional gas turbines producing 340MW each. The gas turbines are identical to the gas turbine in Phase 1, 400kV GIS building and associated compound, Access roads and electrical substation.

The Proposed Development will also include 27 no. staff car parking spaces, site and landscaping works, and all associated ancillary site development infrastructure such as foul and surface water drainage works and internal roads, footpaths, access routes, and all associated engineering and construction site works necessary to facilitate the development. Additionally, the proposal includes the realignment of a section of the Kilshane road and construction of a new roundabout junction (bounding the site to the east).

The Proposed Development is described in further detail in Chapter 2 *Project Description* and in the PCEMP. The details of the construction and operation of the development in terms of Hydrology are detailed in the subsections below.

6.4.1 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 installation of associated services included within the development.
- Possible discharge of collected rainwater/ dewatering 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.

6.4.2 Operational Phase

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

6.4.2.1 Increase in Hard Standing Area

The Proposed Development represents an overall increase of the hardstanding area to 20,310.5 m^2. hardstanding surfaces.

6.4.2.2 Surface Water Management

It is proposed to incorporate a Storm Water Management Plan through the use of various SuDS techniques to treat and minimise surface water runoff from the site. The methodology involved in developing a Storm Water Management Plan for the subject site is based on recommendations set out in the Greater Dublin Strategic Drainage Study (GDSDS) and in the SuDS Manual.

Fingal County Council have requested that the Kilshane Road realignment, which is to be taken in charge, be attenuated separately from the remained of the subject application which is to remain under private management.

Storm water from the site will discharge at a controlled rate, limited to the greenfield equivalent runoff, to the existing ditches forming the site boundary, which are connected to the Huntstown Stream. Rainfall in excess of this will be attenuated in the underground tanks for each catchment The Proposed Development will be designed to incorporate best drainage practice.

It is proposed to introduce permeable paving at parking courts serving the development. Swales will be connected to the surface water network so that any excess flows can be directed to the mains rather than overspilling to open spaces on the site. An underground attenuation system is proposed to be utilised for the development site. These underground tanks are modular systems, which will provide sufficient attenuation volume. These tanks allow suspended particles to settle out of suspension by reducing the velocity of the surface water as it flows through the system.

The system also allows for the percolation of water back to the water table. A flow control device (Hydrobrake) is proposed between the attenuation tank and the outfall headwall. This will limit flow volumes exiting the site to the greenfield equivalent runoff rate.

A Class 1 Petrol interceptor is proposed to be installed before surface water outfalls to the existing ditch system. The Interceptor will remove hydrocarbons from surface flows before they outfall to natural watercourses.

Refer to Engineering Assessment Report (Waterman Moylan, 2025) for further details.

6.4.2.3 Foul Water

A reason for the previous planning applications refusal was the lack of consideration given to the remainder of the lands outside the subject application area, but under the ownership of the applicant. A masterplan has now been developed and the flows from these industrial units which will form a future application, have now been incorporated into the foul design of the subject application.

It is now proposed, due to site topography, to serve the subject application and masterplan lands by a pumping station as agreed with Uisce Éireann, which is to remain under private management. The location, depth, and dimensions of the pumping station as per Drawing Number: 21-099-P203, has been designed in anticipation of the future connection of the masterplan lands.

A 150mm diameter rising main will be constructed from the on-site pumping station for a distance of C. 1,818m to the existing gravity foul network on Mitchelstown Road. While the Kilshane pumping station is closer, it is not considered feasible to undertake the construction of the rising main under the N2 and through the Kilshane Cross junction.

A pre-connection enquiry was submitted to Uisce Éireann with a reference number of CDS500544, the subsequent confirmation of feasibility letter received is included in the accompanying Engineering Report. The foul water will be discharged and treated in EPA Licenced Ringsend WWTP

The proposed pumping station will be sized to accommodate the fully developed masterplan lands and subject application and will provide a storage capacity for 24 hours of foul flow.

6.4.2.4 Water Supply

It is not considered feasible to upgrade the existing watermain network which traverses the N2. As such, it is proposed to connect to the 110mm Ø MOPVC watermain located to the southwest of the site on Kilshane Road to the 50.8 uPVC watermain adjacent to the site via a new 150mm Ø watermain.

6.5 Potential Impacts of the Proposed Development

6.5.1 Construction Phase

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. Mitigation measures included in the design of this project to address these potential impacts are presented in Section 6.6 below.

6.5.1.1 Potential Impacts on Surface Water and Groundwater Quality

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

During the construction phase at this site there is potential for an increase in run-off due to 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. Site investigations classified the subsoils as 'inert' (refer to Chapter 5). The local drainage ultimately flows towards the Huntstown Stream.

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;
- Excavations/ top and sub soil stripping- Increase sediment run off (erosion during rainfall periods), Pollutant mobilisation (heavy metal runoff), Loss of vegetation;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
  Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be contained in a tank and taken by tanker off site for disposal at a licensed waste management facility.

In the absence of mitigation, the effect on the local and regional hydrological environment is likely to be ***short-term, moderate*** and ***negative***. The effect is considered to be 'moderate' is related to the lack of evidence of contamination observed in the subsoils during the ground investigations carried out by Waterman Moylan in 2021 (refer to Chapter 5 for further details); therefore it is not expected a significant effect on local or regional hydrology. It is considered significant due to this potential leakage can affect the receiving waters (Huntstown Stream and River Ward) and degrade the current water body status (chemically, ecological and quantity) or its potential to meet the requirements and/or objectives in the third RBMP 2022-2027.

6.5.1.2 Potential Impacts on Surface Water and Groundwater Flow and Quality

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site as a result of the land clearing and earthworks 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 along with sediment loading, which could potentially impact local drainage if not adequately mitigated. This increase in the rate and volume of direct surface run-off can result in increased sediment loading, scouring impacts on local drainage and watercourses, and downstream impacts.

There are no surface water or groundwater abstractions proposed, therefore no potential impacts on the existing surface water and groundwater regime.

There are no proposed permanent diversions of any waterbodies as part of the Proposed Development.

In the absence of mitigation measures the potential impacts during the construction phase on surface water and groundwater quantity and flow are ***short-term, moderate*** and ***negative***.

6.5.1.3 Potential Impacts on Human Health and Populations

A reduction in water quality via unmitigated pollutants entering into Huntstown Stream, Ward River and Dublin groundwater body (GWB) has the potential to lead to negative impacts on human health and populations. Hydrocarbons and petroleum products for example have the greatest risk for human health

when they are in drinking water. However, it is noted that there are no recorded Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, directly hydrologically connected to the subject site.

Therefore, on this basis in the absence of mitigation measures the potential impacts during the construction phase on human health and populations due to changes to the hydrological environment are ***short-term***, ***slight*** and ***negative***.

6.5.1.4 Potential Impacts on Water Framework Directive & Habitat Status

It should be noted that no impacts are expected on Malahide Estuary SAC/SPA. Given the potential loading and the distance from source to the Natura site (geographical c. 9.6 Km and c.14km along the steam pathway), this risk would be imperceptible as any accidental discharge of potential contaminant would be attenuated, diluted and dispersed below statutory guidelines (i.e., S.I. European Communities Environmental Objectives Regulations, 2009 [S.I. No. 272 of 2009 as amended by SI No. 77 of 2019]).

AWN Consulting have prepared a Water Framework Directive (WFD) Screening Report that is included with the application documentation (Appendix 6.2 of the EIAR).

There is a potential of accidental discharges during the construction phase (as set out in Section 8.5.1.1). However, these are temporary short-lived events that will not impact on the status of the Huntstown Stream, Ward River and Swords groundwater body (GWB) in the long term. As such the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

AWN Consulting have prepared a Water Framework Directive (WFD) Screening Report that is included with the application documentation (Appendix 6.2 of the EIAR).

In the absence of mitigation measures the potential impacts during the construction phase on the Water Framework Directive (WFD) status due to changes to the hydrological environment are ***short-term***, ***slight*** and ***negative***.

6.5.2 Operation Phase

6.5.2.1 Potential Impacts on Surface Water and Groundwater Quality

As stated above, there is a hydrological connection, to the Huntstown Stream, Ward River, and Dublin groundwater body (GWB) during the construction and operational phase. Surface water runoff from roads, car parking, and hardstanding areas, can potentially contain minor levels of contaminants such as hydrocarbons from trafficked areas.

Surface water drainage will join with the Phase 1 permitted drainage network before discharge directly into an existing ditch network which ultimately outfalls into the Huntstown Stream. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100 year event to the attenuation basins without any overland flooding including an additional allowance of 20% in rainfall intensities due to climate change. Discharge flow will be restricted to the greenfield equivalent runoff for the catchment area.

The development will be fully serviced with separate foul and stormwater sewers which will have adequate capacity for the facility and discharge limits as required by Irish Water licencing requirements. Discharge from the site to the public foul sewer will be sewage and grey water only due to the nature of the Proposed Development. The foul discharge from the site will be subject to Uisce Eireann join the public sewer and will be treated at the Irish Water Ringsend Wastewater Treatment Plant (WWTP) prior to subsequent

discharge to Dublin Bay. This WWTP is required to operate under an EPA licence and meet environmental legislative requirements as set out its licence.

Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated. However, any accidental discharge will be mitigated through petrol interceptors.

In the event of an accidental leakage of transformer oil or a spill from the emergency generator, this will be intercepted by the drainage infrastructure; the generator yard passes through petrol interceptor prior to connection to the onsite drainage networks.

In the absence of mitigation, the effect on the hydrological and hydrogeological environment is likely to be ***long-term, imperceptible*** and ***neutral***. The effect is considered to be 'imperceptible' due to there will not be intervention on the hydrological regime on a local or regional scale due to the aforementioned design measures included in the surface water and foul water drainage.

6.5.2.2 Potential Impacts on Surface Water and Groundwater Flow and Quality

The proposed incorporation of hardstand area and the use of SuDS design measures will have a minor effect on local recharge to ground and has the potential to result in increased run-off from the site if not adequately mitigated.

However, the impact on the overall groundwater regime is likely to be insignificant, considering the site area is underlying "Locally Important' Aquifer (LI), which is unlikely to affect groundwater levels.

An increase in surface water runoff can have an adverse effect on the hydrological regime of downstream environments via flooding and inundation to downstream properties.

As described above, there are no recorded past flood events within the proposed site development.

The design of the Proposed Development and drainage infrastructure proposed will ensure that the run-off rate is restricted to greenfield run-off. The development includes the implementation of SuDS and an attenuation system. The design includes for a 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. There are no surface water or groundwater abstractions proposed, therefore no potential impacts on the quantity of surface water or groundwater.

The proposed measures ensures that the Proposed Development will not be impacted by predicted flood events.

In the absence of mitigation measures (or design measures) the potential impacts during the operational phase on surface water and groundwater flow and quantity ***long-term, imperceptible*** and ***neutral***. The effect is considered to be 'imperceptible' due to there will not be intervention on the hydrological regime on a local or regional scale due to the aforementioned design measures.

6.5.2.3 Potential Impacts on Human Health and Populations

There is no potential for unmitigated off-site flooding as a result of the increased hardstanding areas due to the proposed design and drainage infrastructure proposed.

There are no recorded recreational waters, bathing waterbodies, or surface water abstraction points located downstream of, or directly hydrologically connected to the Proposed Development site.

In addition, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas defined by the GSI within the subject area.

Therefore, there is no potential for impacts on human health and populations.

6.5.2.4 Potential Impacts on Water Framework Directive & Habitat Status

It should be noted that no impacts are expected on Malahide Estuary SAC/SPA. Given the potential loading and the distance from source to the Natura site (c. 9.6 Km), this risk would be imperceptible as the potential for an accidental leak is low (no additional bulk chemical storage), the site will be licenced which require ongoing management of pipe containment and monitoring and any unlicenced discharges to ground would be attenuated on site. As such there is no potential for exceedance of statutory guidelines (i.e., S.I. European Communities Environmental Objectives Regulations, 2009 [S.I. No. 272 of 2009 as amended by SI No. 77 of 2019]) at the downgradient Malahide SAC or SPA.

AWN Consulting have prepared a Water Framework Directive (WFD) Screening Report that is included with the application documentation (Appendix 6.2 of the EIAR).There is a low potential of accidental discharges during the operation phase based on potential contaminant loading, containment measures, attenuation use of interceptors etc as the site is required to operate in compliance with an IED licence. As such no likely impact on the status of the Huntstown Stream, Ward River and Swords groundwater body (GWB) in the long term. As such the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

In the absence of mitigation measures the potential impacts during the construction phase on the Water Framework Directive (WFD) status due to changes to the hydrological environment are ***short-term***, ***slight*** and ***negative***.

6.5.3 Do Nothing Scenario

If the Proposed Development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no, excavation or construction at this site. There would, therefore, be a neutral effect on the hydrological environment in terms of hydrological environment.

The site is zoned for development, and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national and regional policies and therefore the likely significant effects would be similar to this proposal. A potential increase in hardstanding areas would be mitigated by requiring developers to maintain green field runoff rates as a result there would be no overall change to flooding but the trend in change of land use will result in local changes to recharge and hydrological flow patterns.

The temporal evolution of the current baseline in terms of water and hydrological environment involves climate change and its effects on the quantity or quality of the surface water. This can potentially affect the surrounding projected flooding.

6.6 Mitigation Measures

The design has taken account of the potential impacts of the development on the hydrological and hydrogeological environments local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the hydrology and hydrogeology.

The site is drained by a local network which is composed of ditches bordering the site. This network ultimately flows in a northerly direction towards the Huntstown Stream, which in turn joins the Ward River. The Ward River flows towards Malahide Estuary, a Natura Site (SPA/SAC/pNHA) located c. 9.8 km to the northeast of the site after joining the Broadmeadow River.

Thus, the site would have an indirect hydrological connection with the Malahide Estuary through the local drainage network, the Huntstown Stream and the Ward River.

As stated above, no impacts are expected on Malahide Estuary SAC/SPA, given the potential loading, tenuous hydrological connectivity and the distance from source to the Natura site. The potential risk is considered to be imperceptible as potential contaminant would be attenuated, diluted and dispersed below statutory guidelines (i.e., S.I. European Communities Environmental Objectives Regulations, 2009 [S.I. No. 272 of 2009 as amended by SI No. 77 of 2019]).

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

6.6.1 Construction Phase

6.6.1.1 Construction Environment Management Plan

In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the Proposed Development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the Proposed Development.

As a minimum, the CEMP will be 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.

In order to reduce impacts on the soil, geological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site as outlined below.

6.6.1.2 Surface Water Run-Off

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

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.

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

Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction. It is estimated that the inflow rate of groundwater will be low and limited to the northeast

of the site. It is therefore proposed that the water be discharged via the existing stormwater sewer network. Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the sewer. The use of slit traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to the sewer. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept relatively dry. Due to the very low permeability of the Dublin Boulder Clay and the relative shallow nature for excavations, infiltration to the underlying aquifer is not anticipated.

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 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.

6.6.1.3 Fuel and Chemical Handling

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site) which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

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

In the case of drummed fuel or other chemical which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

6.6.1.4 Soil Removal and Compaction

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.

Site investigations carried out at the site in 2021 (Refer to Chapter 5) found no residual contamination on site. Nonetheless, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

6.6.2 Operational Phase

6.6.2.1 Fuel and Chemical Handling

The additional fuel requirement is part of the amendment application (FW25A/0523E) for the permitted Phase 1 development. This incorporates full containment for all necessary fuel storage. Delivery pipework will be aboveground and fully contained in line with IED licence requirement.

The SuDs design includes hardstand cover and drainage through an oil interceptor prior to discharge into the attenuation system. Therefore, the risk of accidental discharge to ground or receiving waters has been adequately addressed through design.

6.6.2.2 Emergency Response Procedures

An Environmental Safety and Health Management System (EMS) will be implemented at the Proposed Development (as required for IED licence) during operations. An environmental management plan will apply to the overall development during the operational phase incorporating mitigation measures and emergency response measures. An Emergency Response Plan has been developed for the permitted facility and will be extended to cover this facility. Section 7 and 8 for the ERP outline the procedures to be followed in response to a fire or spill. Section 6 of the Emergency Response Plan outlines the training plan to be provided to site personnel. The Emergency Response Plan will be updated based on final as built design and layout prior to the operational phase.

During operation the site will operate in compliance with the requirements of an Uisce Éireann (UÉ) licence for discharge to sewer.

6.7 Monitoring Measures

6.7.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- Regular inspection of surface water run-off and sediments controls e.g. silt traps will be carried during the construction phase.
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off.
- Regular inspection of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling etc.

6.7.2 Operational Phase

During operation, the site will be required to operate in compliance with UÉ and EPA licence conditions. This includes monitoring of all discharges to storm and foul sewer.

6.8 Residual Impacts of the Proposed Development

6.8.1 Construction Phase

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the hydrological environment do not occur during the construction phase and that the residual impact will be *short-term-imperceptible-neutral*.

6.8.2 Operational Phase

The implementation of mitigation measures highlighted above will ensure that the predicted impacts on the hydrological environment do not occur during the operational phase and that the residual impact will be *long-term-imperceptible-neutral*. Following the TII criteria (refer to Appendix 6.1) for rating the magnitude and significance of impacts on the hydrological related attributes, the magnitude of impact is considered *negligible*.

6.9 Cumulative Impacts of the Proposed Development

The following considers the cumulative impacts of the Proposed Development and proposed and permitted and operating facilities in the surrounding area in relation to Hydrology and Hydrogeology. This considers the Proposed Development and other surrounding planned proposed and permitted developments identified Chapter 2 for cumulative assessment. In particular there will be overlap with the construction of the permitted Phase 1 development. In addition, the 2 additional turbines on the proposed site will require the installation of a 400kv connection. Design for the project has yet to be finalised, however, preliminary designs suggesting the connection will follow the R135 in a North Westerly direction and terminates North of the village of Coolquay, co. Dublin.

The primary threats, pressures and activities with potential for significant effects on the Natura 2000 sites examined (with High Ranking) are Agriculture, Urbanisation/Human disturbances, Pollution and Natural System modification (primarily modifications in hydrology). All identified potential likely cumulative impacts are associated with change of landuse from greenfield and impacts to soil and water.

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.

6.9.1 Construction Phase

In relation to the potential cumulative impact on water bodies during the construction phase, the construction works for all projects listed in Chapter 2 Section 2.10 have been considered. There is potential for cumulative impact on water quality and flow and resultant impact on water habitats as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.
- Contamination of surface water and groundwater from accidental spillage and leakage from construction traffic and construction materials can cause damage to receiving watercourses.
- Excavation along the R135 for the 400 kv connection will require localised removal of potentially contaminated soil.

As with the proposed project, the works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect surface water and groundwater quality in compliance with legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and amendments) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and amendments). The implementation of mitigation measures as detailed in Chapter 6 section 6.6 Mitigation Measures as well as the compliance of other developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological and hydrogeological environment during the construction phase of the proposed development. As the proposed project does not require any water abstraction or diversion of a watercourse there is no potential for cumulative impact on water flow or quantity.

The residual cumulative impact of the proposed development on biodiversity in combination with other planned or permitted developments during construction can therefore be considered to be **short-term, not significant and localised**.

As a result, there will be minimal cumulative potential for change in surface water quality or the natural hydrological regime. The cumulative impact is considered to be *neutral* and *imperceptible*.

6.9.2 Operational Phase

One facility is considered to have potential cumulative impacts upon the hydrological and hydrogeological environment. PA06F.312131, The Greater Dublin Drainage Project will operate a wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility. Once constructed this additional treatment facility should result in a cumulative improvement in water quality within Dublin Bay.

Taking into account the SuDS control measures within the cumulative developments, along with the design measures to compensate from impacts to recharge rates to the underlying aquifer due to additional hardstanding there will be minimal cumulative potential for change in ground water quality during the operational phase.

The impact of existing developments is evident based on assessment of current EPA water body status. The groundwater body is classified as "Good" in the most recent WFD cycle (2019-2024). The Huntstown Stream which belongs to the Ward_030 WFD surface water body is classified as 'Moderate' and is 'At risk of not achieving good status'. This Moderate status relates to the nitrogen (nitrate, specifically) and orthophosphate conditions measured in the Ward River as a result of urban wastewater and agricultural pressures.

There is a low potential of accidental discharges during the operation phase of the proposed or permitted Kilshane developments as the site will be required to operate in compliance with an IED licence which ensures any bulk chemicals and chemical transfer lines are fully contained, interceptors and attenuation are in place and monitoring undertaken prior to discharge to surface water. As such no significant likely impact on the status of the Huntstown Stream, Ward River and Swords groundwater body (GWB) in the long term. All proposed and permitted developments will be required to ensure there developments have design measures in place to protect surface water and groundwater quality in compliance with legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and amendments) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and amendments). As such the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

The cumulative impact is considered to be *neutral not significant and long-term*.

Chapter 7 – Biodiversity

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7. BIODIVERSITY

7.1 Introduction

This chapter was carried out by Altemar Ltd. It assesses the biodiversity value of the Proposed Development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZoI).

The programme of work in relation to biodiversity aspects have been designed to identify and describe the existing ecology of the area and detail sites, habitats or species of conservation interest. It also assesses the significance of the likely impacts of the Proposed Development on the biodiversity elements and designs mitigation measures to alleviate identified impacts.

A separate Appropriate Assessment Screening Report, in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive (EC, 2001), has been produced by Altemar Ltd. to identify any likely significant effects of the development on European sites, Annex species or Annex habitats. It concludes that '*the proposed development would not give rise to any significant effects to designated sites*.'

Standard construction and operational phase control measures, in addition to monitoring measures are included in the design to minimise potential impacts and to improve the biodiversity potential of the Proposed Development site.

7.2 Methodology

This chapter has been prepared having regard to the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013).
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2 (National Roads Authority, 2009)
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016)
- Bat Mitigation Guidelines for Ireland V2 (Marnell, et al, 2022)
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2006)
- Bird Monitoring Methods - A Manual of Techniques for Key UK Species (Gilbert et al., 1998).
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).
- Guide to Habitats in Ireland (Fossitt, 2000).

7.2.1 Spatial Scope and Zone of Influence

As outlined in CIEEM (2018) 'The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.' In line with best practice guidance an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995).

IEEM (2016) defined the zone of influence as "the areas/resources that may be affected by the biophysical changes caused by activities associated with a project". In order to define the extent of the study area for ecological assessment, all elements of the project were assessed and reviewed in order to identify the spatial

scale at which ecological features could be impacted. Due to the limited temporal and geographical scale of the project it is considered that the impacts of the Proposed Development would not extend beyond the site outline, with the exception of potential impacts on downstream aquatic biodiversity via the indirect pathway of the surface water drainage network. The project would also involve reprofiling, excavations, and construction, which may impact beyond the site through noise, dust, light, and water quality impacts. Standard but robust construction phase controls need to be implemented to limit the potential impact of the Proposed Development into the surrounding environment. The ZOI of the operation of the Proposed Development would be the immediate area of the Proposed Development site.

7.2.2 Desk Study

A desk study was undertaken to gather and assess ecological data prior to undertaking fieldwork elements. Sources of datasets and information included:

- The National Parks and Wildlife Service
- National Biological Data Centre
- Satellite, aerial and 6" & 25" map imagery
- ESRI (QGIS)

A provisional desk-based assessment of the potential species and habitats of conservation importance was carried out in June 2025 and revised in November 2025. Altemar assessed the project, the proposed construction methodology and the operation of the Proposed Development.

7.2.3 Field Survey

Field surveys were conducted on the Proposed Development site by Altemar Ltd. with the aim of mapping habitats and detecting the presence, or likely presence, of a range of protected species. These surveys provided baseline information regarding the ecology of Proposed Development site.

Each of the surveys undertaken, the surveyor(s), and the dates in which each of the surveys took place are outlined in Table 7-1. below. The methodologies followed for each of these surveys are detailed in the following sections.

Table 7-1 Field Surveys

Survey	Surveyor(s)	Date(s)
Flora, invasive species, mammals, and bat roost suitability	Kalvin Townsend-Smyth	19th June 2025
Breeding birds	Kalvin Townsend-Smyth & Jack Doyle	13th, 19th & 25th June 2025
Bats	Kalvin Townsend-Smyth	19th June & 10th July 2025

7.2.3.1 Flora

The flora survey followed *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011) where habitats were classified in accordance with *A Guide to Habitats in Ireland* (Fossitt, 2000). The flora survey also aimed to identify any habitats that corresponded to those listed on Annex I to the Habitats Directive using the *Interpretation Manual of European Union Habitats* (EC, 2013). Any restricted invasive plant species listed on the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) were also noted and mapped.

7.2.3.2 Terrestrial Mammals

A badger survey was undertaken with the aim of identifying the presence, or likely presence, of Badger (*Meles meles*) within or immediately adjacent to the site of the Proposed Development. The badger survey followed best practice guidance (NRA, 2008), and involved a systematic search for evidence of badgers, such as setts, latrines, mammal paths, etc.

There was no suitable habitat for Otter (*Lutra lutra*) within the Proposed Development site, therefore an otter survey was not deemed necessary. The closest watercourse to the Proposed Development is the Huntstown Stream, a small stream running along a hedgerow beyond the southern boundary of the Proposed Development site.

Incidental sightings of other mammal species (E.g. Hedgehog or Fox) or evidence of mammals were noted during this survey.

7.2.3.3 Breeding Birds

Breeding bird surveys were carried out following the BTO Common Bird Census (Bibby *et al.*, 2000 and Gilbert *et al.*, 1998) and following CIEEM guidelines. Surveys were carried out within the breeding bird survey season and initiated within 1 hour before/after sunrise. A 15-minute settlement period was given following arrival to allow resumption of bird activity after any possible disturbance caused by arrival to the site. A single transect following the full perimeter of the site, covering all areas and features available for breeding activity within the survey area was established. A total of three surveys were carried out across three separate dates. Progress along the transect was slow, with pauses every few meters as appropriate to locate and identify any birds, and continuing once all birds observed within an area/feature had been recorded. Each survey took 2 hours to complete. Care was taken not to double count any observations. Weather conditions were optimal on each occasion.

7.2.3.4 Bats

A bat suitability assessment was undertaken as part of the walkover survey to identify built or natural features within the Proposed Development site with potential to support roosting bats. The bat suitability assessment was conducted adhering to best practice guidance (NRA, 2008b,c; Collins (ed.), 2016) and involved a visual assessment for suitable features on trees for supporting roosting bats. There were no suitable buildings within the vicinity of the Proposed Development.

Additionally, two bat surveys (emergent and detector) were carried out on site at dusk using a Batbox Duet detector to determine bat activity. Bats if present were identified by their ultrasonic calls coupled with behavioural and flight observations.

7.2.3.5 Reptiles and Amphibians

During the walkover survey, the potential for the Proposed Development site to support protected reptiles and amphibians was assessed.

7.2.3.6 Survey Limitations

The surveys covered appropriate seasons for flora, breeding bird, and bat assessments. The survey was outside the optimal time of year for terrestrial mammal assessments. There was no evidence of mammal activity on site. All areas of the site were accessible and there are no limitations seen in relation to the surveys.

7.2.4 Consultation

The National Parks and Wildlife Service (NPWS) was consulted in relation to species and sites of conservation interest. Data of rare and threatened species were acquired from NPWS. The National Biological Data Centre records were consulted for species of conservation significance.

7.2.5 Forecasting Methods and Difficulties Encountered

7.2.5.1 Impact Assessment Significance Criteria

This section of the chapter outlines the methods and criteria used to assess the likely significant effects to the species and habitats that occur within the ZoI as a result of the Proposed Development. These impacts could arise during either the construction or operational phases of the Proposed Development. The following terms are derived from EPA EIAR Guidance and are used in the assessment to describe the predicted and potential residual impacts on the ecology by the construction and operation of the Proposed Development.

Table 7-2 Magnitude and impact and typical descriptions

Magnitude of impact (change)		Typical description
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring
Negligible	Adverse	Very minor loss or alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.

Table 7-3 Criteria for Establishing Receptor Sensitivity/Importance

Importance	Ecological Valuation
International	Sites, habitats or species protected under international legislation e.g. Habitats and Species Directive. These include, amongst others: SACs, SPAs, Ramsar sites, Biosphere Reserves, including sites proposed for designation, plus undesignated sites that support populations of internationally important species.
National	Sites, habitats or species protected under national legislation e.g. Wildlife Act 1976 and amendments. Sites include designated and proposed NHAs, Statutory Nature Reserves, National Parks, plus areas supporting resident or regularly occurring populations of species of national importance (e.g. 1% national population) protected under the Wildlife Acts, and rare (Red Data List) species.
Regional	Sites, habitats or species which may have regional importance, but which are not protected under legislation (although Local Plans may specifically identify them) e.g. viable areas or populations of Regional Biodiversity Action Plan habitats or species.
Local/County	Areas supporting resident or regularly occurring populations of protected and red data listed-species of county importance (e.g. 1% of county population), Areas containing Annex I habitats not of international/national importance, County important populations of species or habitats identified in county plans, Areas of special amenity or subject to tree protection constraints.
Local	Areas supporting resident or regularly occurring populations of protected and red data listed-species of local importance (e.g. 1% of local population), Undesignated sites or features which enhance or enrich the local area, sites containing viable area or populations of local Biodiversity Plan habitats or species, local Red Data List species etc.
Site	Very low importance and rarity. Ecological feature of no significant value beyond the site boundary

Table 7-4 Quality of Potential Impacts on Biodiversity

	Impact Description
Negative /Adverse Impact	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Neutral Impact	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive Impact	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

Table 7-5 Significance of Impacts

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

Table 7-6 Duration of Impact

Duration of Impact	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Extent of Effects	Description
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

As outlined in IEEM (2010) 'assessment of impacts should be undertaken in relation to the baseline conditions within the zone of influence of the Proposed Development'. Impacts during site preparation, construction and operation on ecological receptors were quantified and characterised based on IEEM impact characterisation (IEEM, 2010). Following an evaluation of ecological receptors, the potential impact (positive, neutral or adverse) of the project on the ecological receptors was carried out based on the criteria in an impact significance matrix (based on NRA, 2009).

No difficulties or limitations were encountered in relation to the assessment of predicted likely significant effects on biodiversity that may arise as a result of the construction or operation of the Proposed Development.

7.3 Receiving Environment

7.3.1 Desk Study Results

7.3.1.1 Designated Sites

Designated conservation sites (National and international) within 15km of the Proposed Development are seen in Figures 7-1. – 7-6. and Tables 7-7. – 7-9. It should be noted that the Proposed Development site is not within a designated conservation area. The closest European sites with a hydrological connection to the site are the Malahide Estuary SAC and SPA (9.6 km from the subject site) (Figures 7-3. and 7-4.). There are no designated Natural Heritage Areas (NHA) within a 15km radius, however, the nearest Proposed NHA (Royal Canal pNHA) is located 4.7 km from the site (Figure 7-5.). The closest RAMSAR Site is Broadmeadow Estuary at 9.6 km (Figure 7-6.). Watercourses located proximate to the subject site are demonstrated in Figures 7-3. And 7-4.

The nearest watercourse is immediately adjacent to the site at the southwestern corner. This is the Huntstown Stream a tributary of the River Ward which in turn is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary. During operation, after onsite attenuation, it is proposed to discharge surface water from the development to an unnamed drainage ditch at an approximate minimum distance of 125 m to the east of the site, which outfalls to the Huntstown Stream. Furthermore, there is the potential for silt and contaminants to enter the surface water network during the construction phase of development. Therefore, there is a hydrological pathway to the Malahide Estuary SAC and SPA though the pathway is lengthy allowing for significant attenuation and dilution of any temporary accidental discharges (ref: Chapter 6.5.2 Potential Impacts on Water Framework Directive & Habitat Status).

Table 7-7 European sites within 15km of the Proposed Development site

Code	European Site	Distance	Direct Hydrological / Biodiversity Connection
Special Areas of Conservation			
IE000205	Malahide Estuary SAC	9.6 km	No
IE000206	North Dublin Bay SAC	11.9 km	No
IE001398	Rye Water Valley/Carton SAC	12.1 km	No
IE000210	South Dublin Bay SAC	12.3 km	No
IE000199	Baldoyle Bay SAC	12.4 km	No
IE000208	Rogerstown Estuary SAC	12.4 km	No
Special Protection Area			
IE004025	Malahide Estuary SPA	9.6 km	No
IE004024	South Dublin Bay and River Tolka Estuary SPA	9.6 km	No
IE004006	North Bull Island SPA	11.9 km	No
IE004016	Baldoyle Bay SPA	12.5 km	No
IE004015	Rogerstown Estuary SPA	13.1 km	No
IE004236	North-West Irish Sea SPA	13.7 km	No

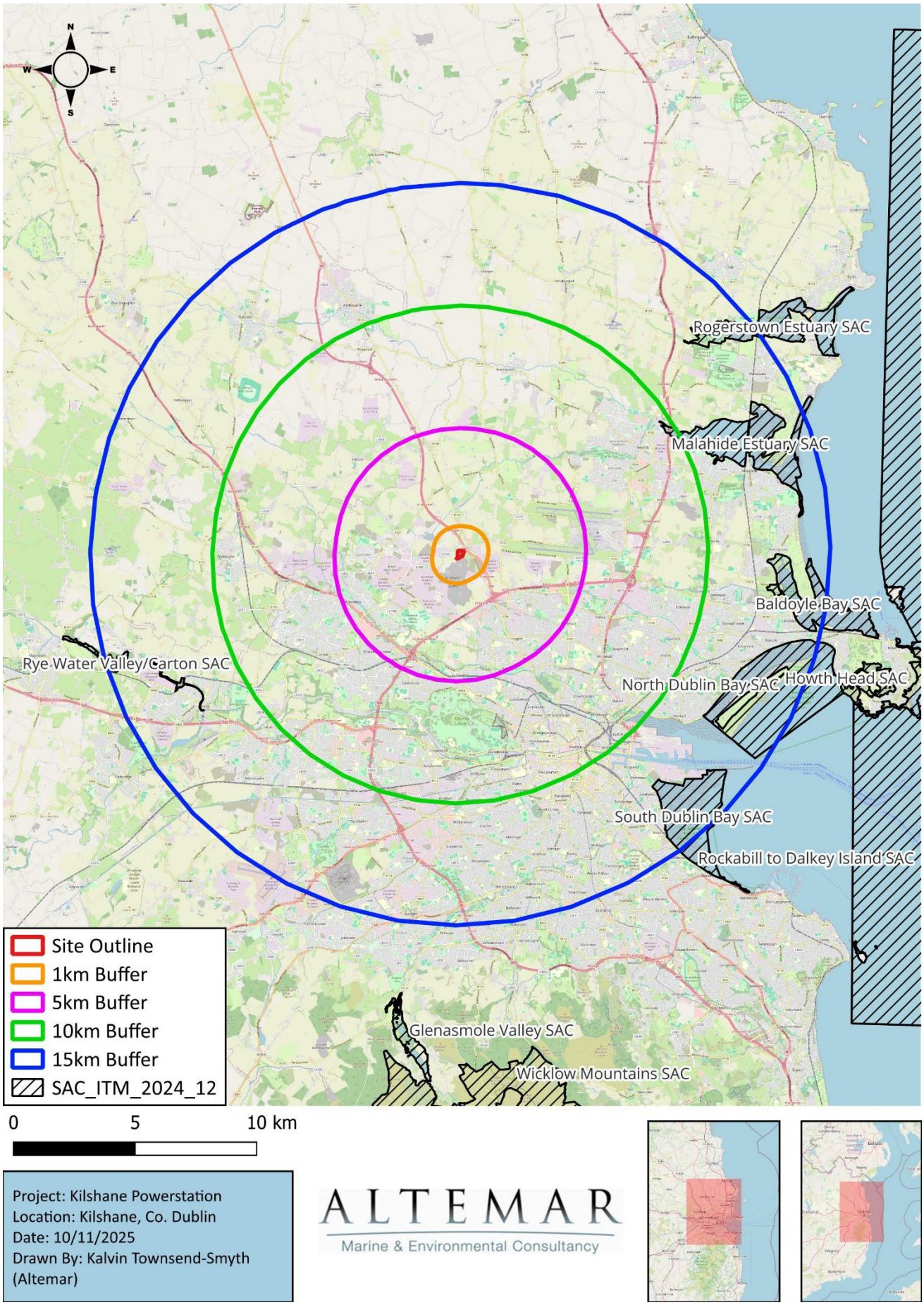
Table 7-8 pNHAs within 15km of the Proposed Development site

Code	Site Name	Distance	Direct Hydrological / Biodiversity Connection
002103	Royal Canal	4.7 km	No
000178	Santry Demesne	5.0 km	No
000128	Liffey Valley	6.7 km	No
001208	Feltrim Hill	8.8 km	No
000206	North Dublin Bay	9.4 km	No
002104	Grand Canal	9.5 km	No
000205	Malahide Estuary	9.5 km	No
001763	Sluice River Marsh	11.7 km	No
001398	Rye Water Valley/Carton	12.2 km	No
000210	South Dublin	12.3 km	No
000199	Baldoyle Bay	12.4 km	No
000201	Dolphins, Dublin Docks	12.4 km	No
000208	Rogerstown Estuary	12.4 km	No
000991	Dodder Valley	14.7 km	No
001205	Booterstown Marsh	14.9 km	No

Table 7-9 pNHAs within 15km of the Proposed Development site

Site Name	Distance	Direct Hydrological / Biodiversity Connection
Broadmeadow Estuary	9.6 km	No
North Bull Island	12.0 km	No
Sandymount Strand/Tolka Estuary	12.3 km	No
Baldoyle Bay	12.5 km	No
Rogerstown Estuary	14.8 km	No

Figure 7-1. SACs within 15km of the Proposed Development



Project: Kilshane Powerstation
Location: Kilshane, Co. Dublin
Date: 10/11/2025
Drawn By: Kalvin Townsend-Smyth (Altemar)

ALTEMAR
Marine & Environmental Consultancy

Figure 7-2. SPAs within 15km of the Proposed Development

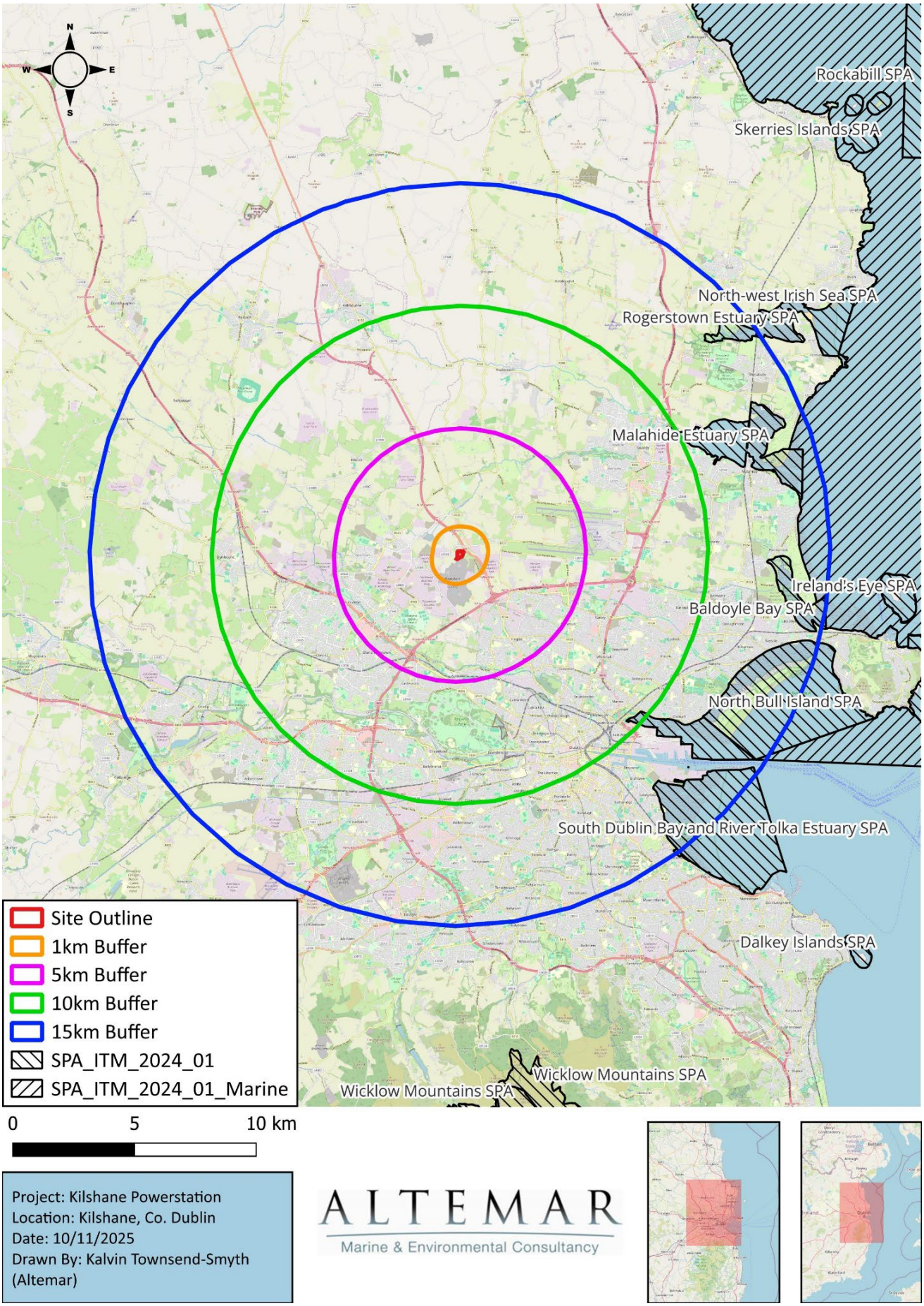
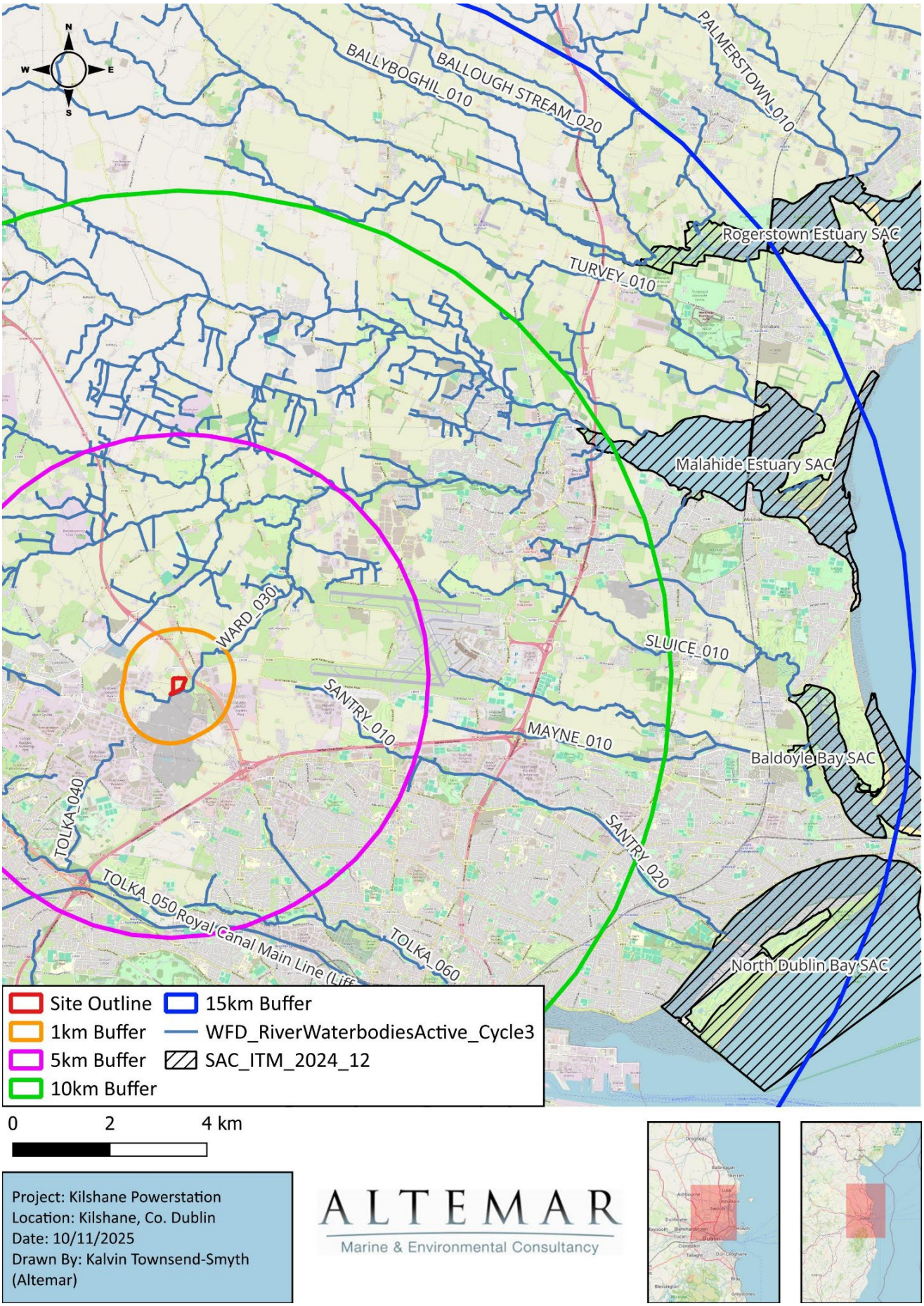


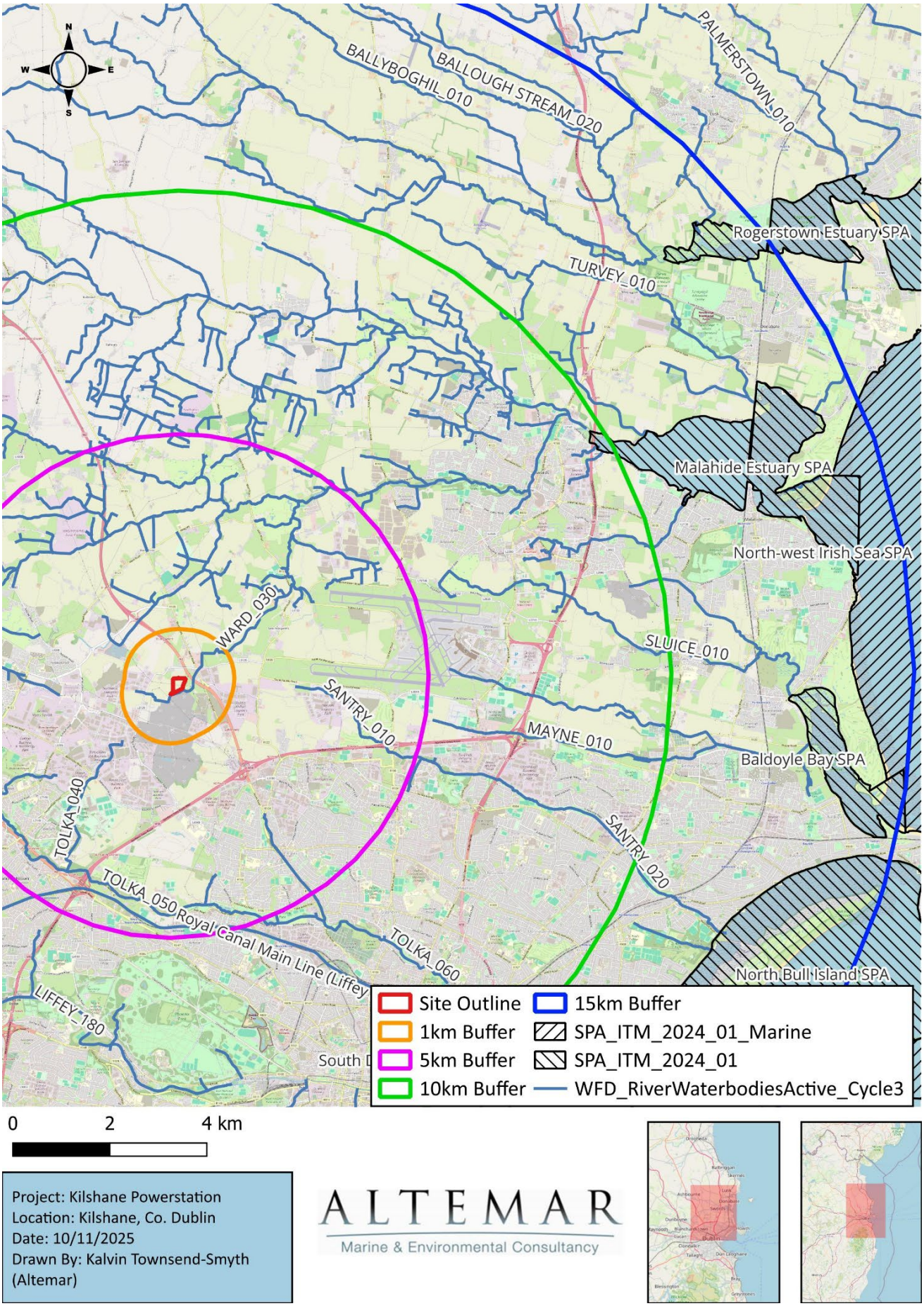
Figure 7-3. Hydrological Connectivity to SACs



Project: Kilshane Powerstation
Location: Kilshane, Co. Dublin
Date: 10/11/2025
Drawn By: Kalvin Townsend-Smyth (Altemar)

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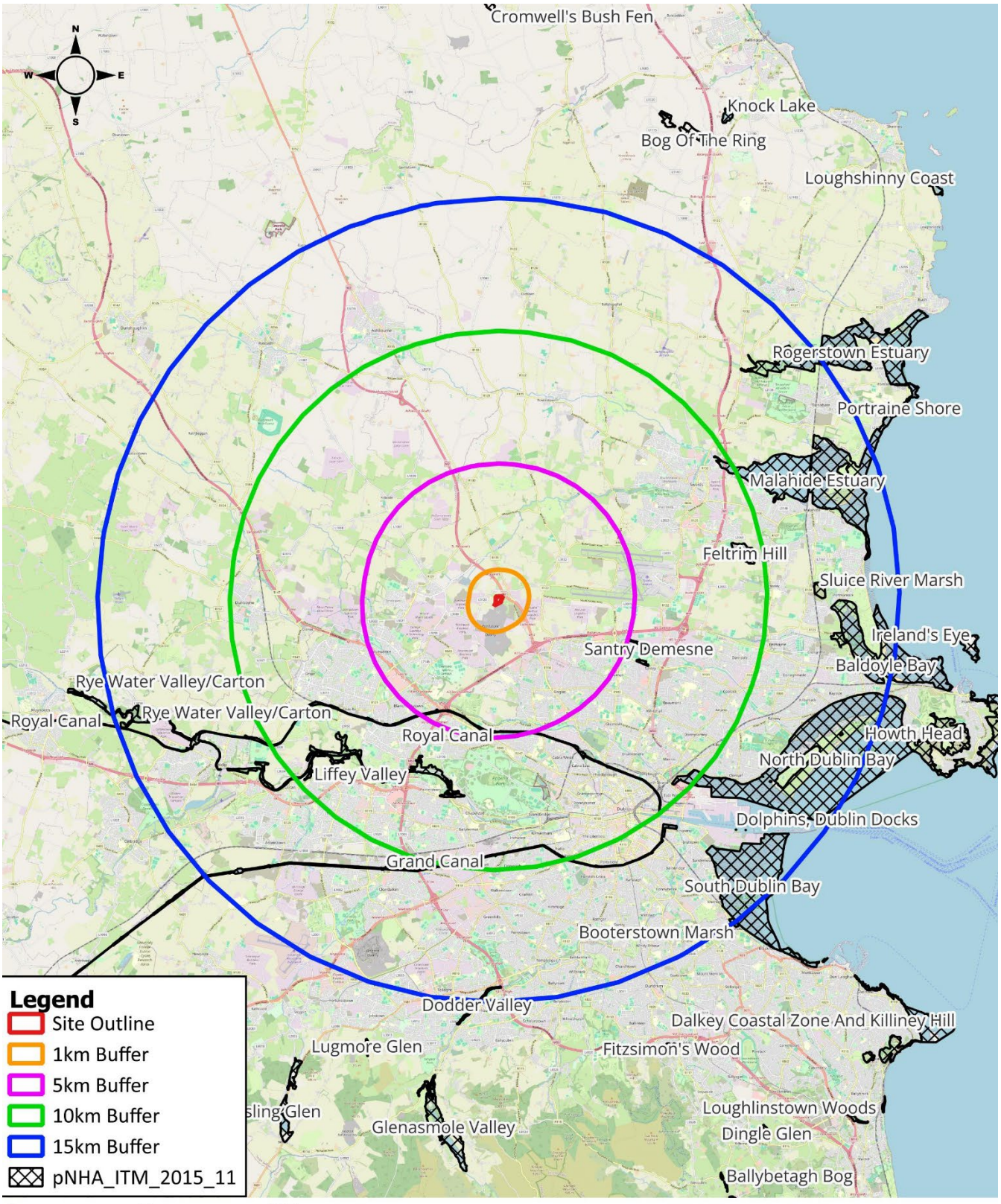
Figure 7-4. Hydrological connectivity to SPAs



Project: Kilshane Powerstation
Location: Kilshane, Co. Dublin
Date: 10/11/2025
Drawn By: Kalvin Townsend-Smyth (Altemar)

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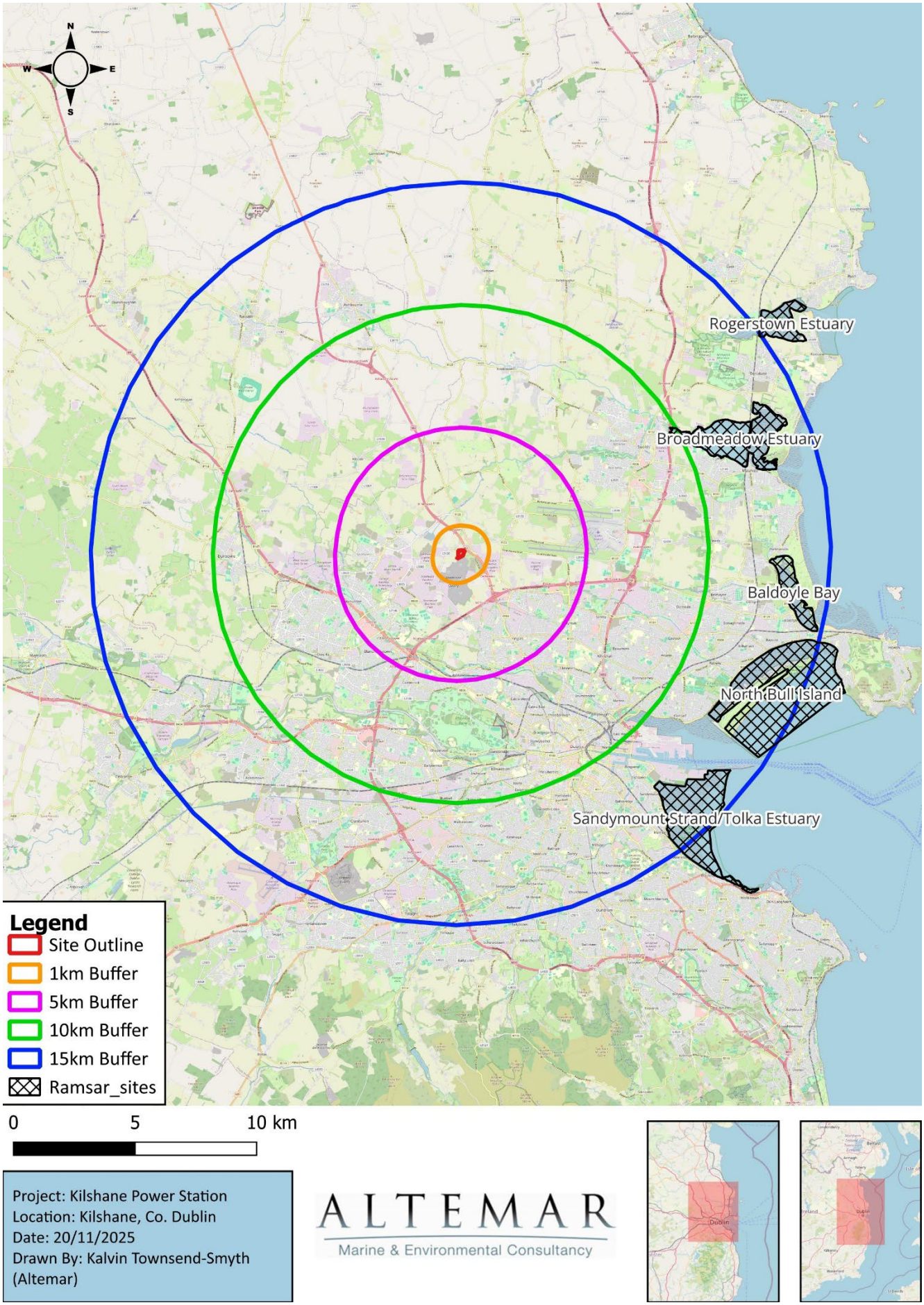
Figure 7-5. pNHAs within 15km of the Proposed Development



Project: Kilshane Power Station
Location: Kilshane, Co. Dublin
Date: 20/11/2025
Drawn By: Kalvin Townsend-Smyth (Altemar)

ALTEMAR
Marine & Environmental Consultancy

Figure 7-6. Ramsar Sites within 15km of the Proposed Development



7.3.1.2 Historic Records of Biodiversity

The National Biodiversity Data Centre's online viewer was consulted in order to determine the extent of biodiversity and/or species of interest in the area. First, an assessment of the site-specific area was carried out and it recorded no species of interest in the site area.

Following this a 2km^2 grid (O14B) was assessed. Table 7-10. below provides a list of all species recorded in the grid area that possess a specific designation, such as Invasive Species or Protected Species.

Table 7-10 Recorded species, associated designations and grid references

Date of Record	Species Name	Designation
31/12/2011	Goldcrest (*Regulus regulus*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	Greenfinch (*Chloris chloris*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	House Martin (*Delichon urbicum*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	House Sparrow (*Passer domesticus*)	Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	Lapwing (*Vanellus vanellus*)	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
31/12/2011	Linnet (*Linaria cannabina*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	Mistle Thrush (*Turdus viscivorus*)	Protected Species: Wildlife Acts
31/12/2011	Pheasant (*Phasianus colchicus*)	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
31/12/2011	Redwing (*Turdus iliacus*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
31/12/2011	Robin (*Erithacus rubecula*)	Protected Species: Wildlife Acts
31/12/2011	Rock Dove (*Columba livia*)	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species

31/12/2011	Starling (*Sturnus vulgaris*)	Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/07/1991	Stock Dove (*Columba oenas*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
31/12/2011	Swallow (*Hirundo rustica*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/12/2011	Swift (*Apus apus*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
31/07/1991	Willow Warbler (*Phylloscopus trochilus*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
31/07/1991	Yellowhammer (*Emberiza citrinella*)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
13/09/2023	Hedgehog (*Erinaceus europaeus*)	Protected Species: Wildlife Acts
14/09/2017	Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts

An assessment of files received from the NPWS (Code No. 2022_120) which contain records of rare and protected species and grid references for sightings of these species was carried out as part of this Biodiversity Chapter. No records of any rare and protected species were found proximate to the subject site.

7.3.2 Field Survey Results

7.3.2.1 Habitats

Habitats within the proposed site were classified according to Fossitt (2000) (Figure 7-7.).

BC1 – Arable crops

The southern half of the site has been planted with wheat. As this habitat consists of a well-managed monoculture, it would be considered to be of low biodiversity value.

Plate 7-1. Arable crops within the site of the Proposed Development



ED3/GS2 – Recolonising bare ground / Dry meadows and grassy verges

The northern half of the site was cleared in recent years and has been recolonised by several local pioneer species. While some areas of exposed ground are still visible, the vegetation cover has become well established, with patches of grassland developing throughout, forming a mosaic. These grassland areas are best represented at the boundaries of the field and at the bases of pylons. Prickly sowthistle (*Sanchus asper*) was the most dominant species recorded within this habitat. Other species noted included spear thistle (*Cirsium vulgare*), creeping thistle (Cirsium arvense, dandelion (*Taraxacum officinale*), ragwort (*Jacobaea vulgaris*), greater plantain (*Plantago major*), dock (*Rumex sp.*), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), rosebay willowherb (*Chamaenerion angustifolium)*, teasel (*Dipsacus fluxonium*), field pansey (*Viola arvensis*), butterbur (*Petasites hybridus*), poppy (*Papaver rhoeas*), lesser burdock (*Arctium minus*), and red clover (*Trifollium pratense*).

Plate 7-2. Recolonising bare ground and dry meadows and grassy verges within the site of the Proposed Development



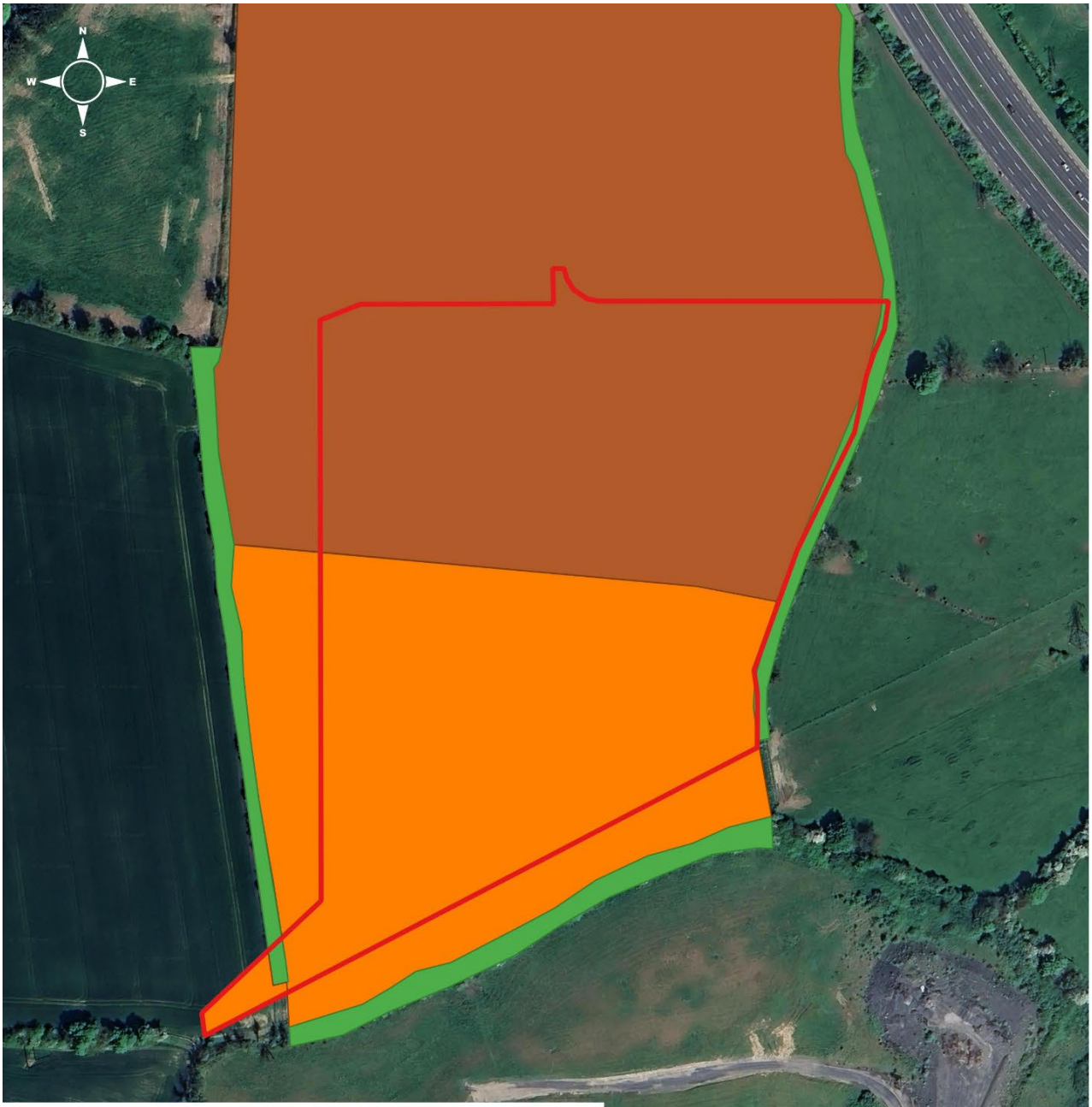
WL2 – Treelines

Mature treelines form the boundaries of the field in which the Proposed Development site is located. The most abundant species encountered along these treelines included ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), sycamore (*Acer pseudoplatanus*), and elder (*Sambucus nigra*). Other species noted within this habitat included bramble (*Rubus fruticosus*), ivy (*Hedera helix*), blackthorn (*Prunus spinosa*), cleavers (*Galium aparine*), nettle (*Urtica dioica*), creeping thistle (*Cirsium arvense*), spear thistle (*Cirsium vulgare*), hogweed (*Heracleum sphondylium*), dog rose (*Rosa canina*), willow (*Salix sp.*), wild angelica (*Angelica sylvestris*), and butterfly bush (*Buddleja davidii*).

Plate 7-3. Recolonising bare ground and dry meadows and grassy verges (foreground), and treelines (background) within the site of the Proposed Development



Figure 7-7. Habitat Mapping



7.3.2.1.1 Evaluation of Habitats

No rare or protected habitats were noted on site during the field survey. The treelines that bound the site of the Proposed Development hold the greatest value for biodiversity as they provide suitable breeding and foraging habitat for bats and birds. The area of recolonising bare ground and dry meadows provides some floral diversity that benefits local pollinators and provides foraging opportunities for bats and birds. The area of wheat crop holds the lowest value for biodiversity as it is a well-managed monoculture. No habitats listed in Annex I of the Habitats Directive were identified on site.

7.3.2.2 Flora

The plant species encountered at the various locations on site are detailed above. No protected species were noted on site. No invasive species subject to restrictions under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) were noted on site. Butterfly Bush (*Buddleja davidii*) was noted on site which is a noxious weed and is considered a medium impact non-native invasive species according to the National Biodiversity Data Centre.

7.3.2.3 Terrestrial Mammals

No signs of mammals of conservation importance were noted on site during the field survey. Rabbit (*Oryctolagus cuniculus*) was the only mammal species recorded on site during the field survey.

7.3.2.4 Bats

Most trees on site are not considered suitable for roosting bats due to their small size. Several trees, while still relatively small, were covered in heavy ivy growth. Despite having the greatest potential to support roosting bats, they are deemed to be of low suitability. No bats were noted emerging from any trees on site. No evidence of bats roosting was noted on site.

Three species of bats were identified during the detector survey, including Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus*), and Soprano Pipistrelle (*Pipistrellus pygmaeus*). Despite the moderate activity recorded on site, there was little foraging activity as most bats were observed commuting. Bat flightlines are mapped and displayed in Figure 7-8.

7.3.2.5 Breeding Birds

7.3.2.5.1 Habitats of breeding bird potential

A desk and ground level breeding habitat assessment were carried out and used to examine the vegetation on site for features that could provide breeding habitat. The only suitable nesting features for breeding birds noted on site during the survey were the treelines. All areas on site were assessed. There were no buildings on site.

7.3.2.5.2 Breeding activity survey

A total of 18 species were recorded on site across three surveys. Just one of these species, namely blackbird, was confirmed breeding during at least one survey. A total of 6 species showed signs of probable breeding, 10 species were considered possible breeders, and just one species was non-breeding. The distribution of breeding status and species of conservation concern were mapped throughout the site and are displayed in Figures 7-9. And 7-10.

Three amber-listed bird species of conservation concern were recorded on site: herring gull, spotted flycatcher, and swallow. No red listed bird species of conservation concern were recorded on site. No amber or red listed species of conservation concern in Ireland were observed breeding on site. Herring Gull was the only species listed as a Qualifying Interest of an SPA (North-West Irish Sea SPA) within 15km

of the Proposed Development site that was observed on site. This species was observed flying over the site and was found to be non-breeding during the survey.

Table 7-11 Total species recorded within the survey area.

Common Name	Latin Name	BoCCI	Breeding Status
Blackbird	*Turdus merula*	Green	Confirmed breeding
Blue Tit	*Cyanistes caeruleus*	Green	Possible breeder
Bullfinch	*Pyrrhula pyrrhula*	Green	Probable breeding
Buzzard	*Buteo buteo*	Green	Possible breeder
Chaffinch	*Fringilla coelebs*	Green	Probable breeding
Goldfinch	*Spinus spinus*	Green	Probable breeding
Great Tit	*Parus major*	Green	Possible breeder
Herring Gull	*Larus argentatus*	Amber	Non-breeding
Hooded Crow	*Corvus cornix*	Green	Possible breeder
Jackdaw	*Corvus frugilegus*	Green	Possible breeder
Magpie	*Pica pica*	Green	Probable breeding
Pheasant	*Phasianus colchicus*	Green	Possible breeder
Robin	*Turdus migratorius*	Green	Possible breeder
Rook	*Corvus frugilegus*	Green	Possible breeder
Spotted Flycatcher	*Muscicapa striata*	Amber	Possible breeder
Swallow	*Apus apus*	Amber	Probable breeding
Wood Pigeon	*Columba palumbus*	Green	Probable breeding
Wren	*Troglodytes troglodytes*	Green	Possible breeder

7.3.2.6 Amphibians and Reptiles

The common frog (*Rana temporaria*), newts (*Triturus vulgaris*), or common lizard (*Zootoca vivipara*) were not observed on site. No suitable habitats for amphibians or reptiles were recorded on site during the field survey.

Figure 7-8. Bat Flightlines

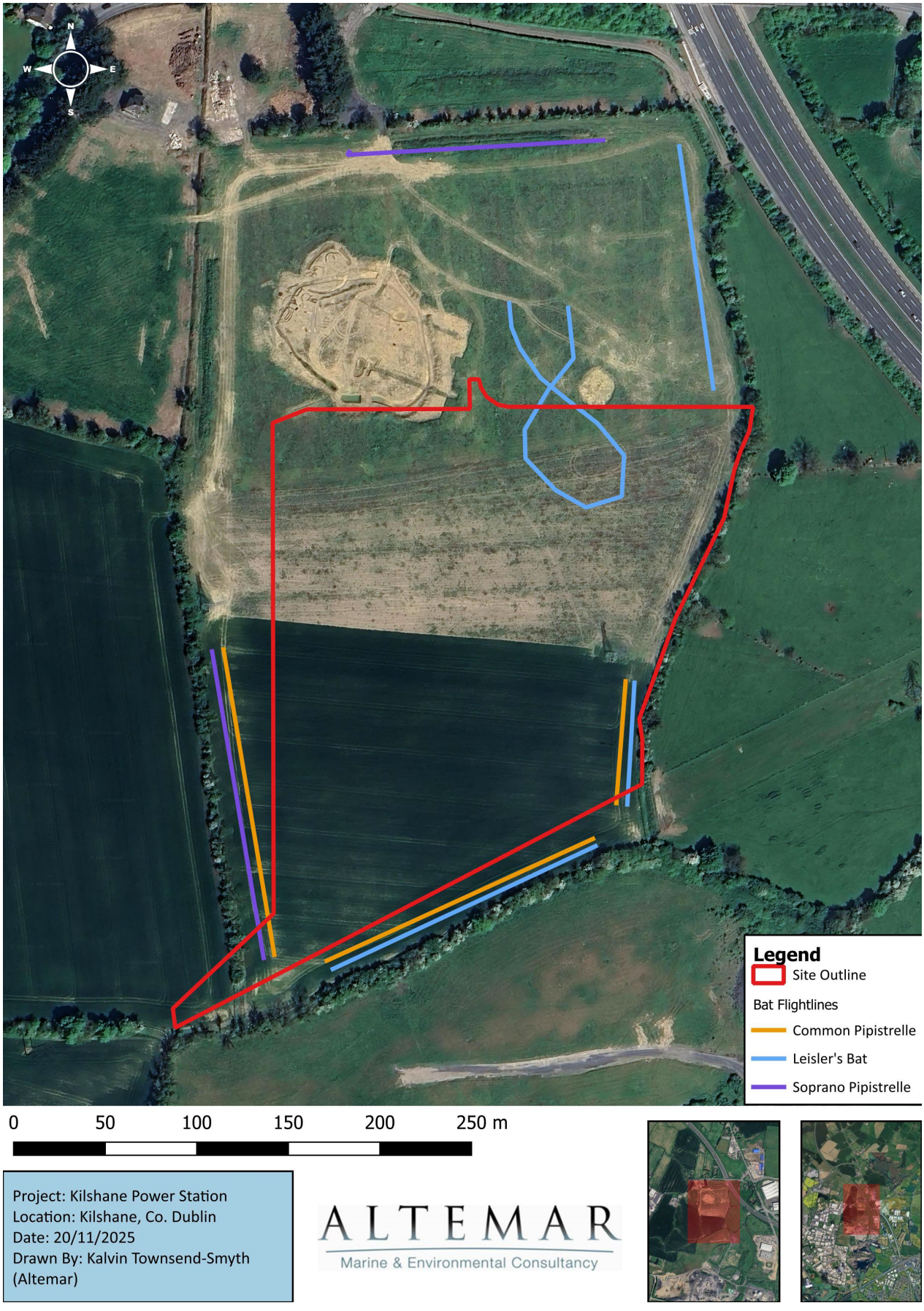


Figure 7-9. Distribution of Amber & Green listed bird species

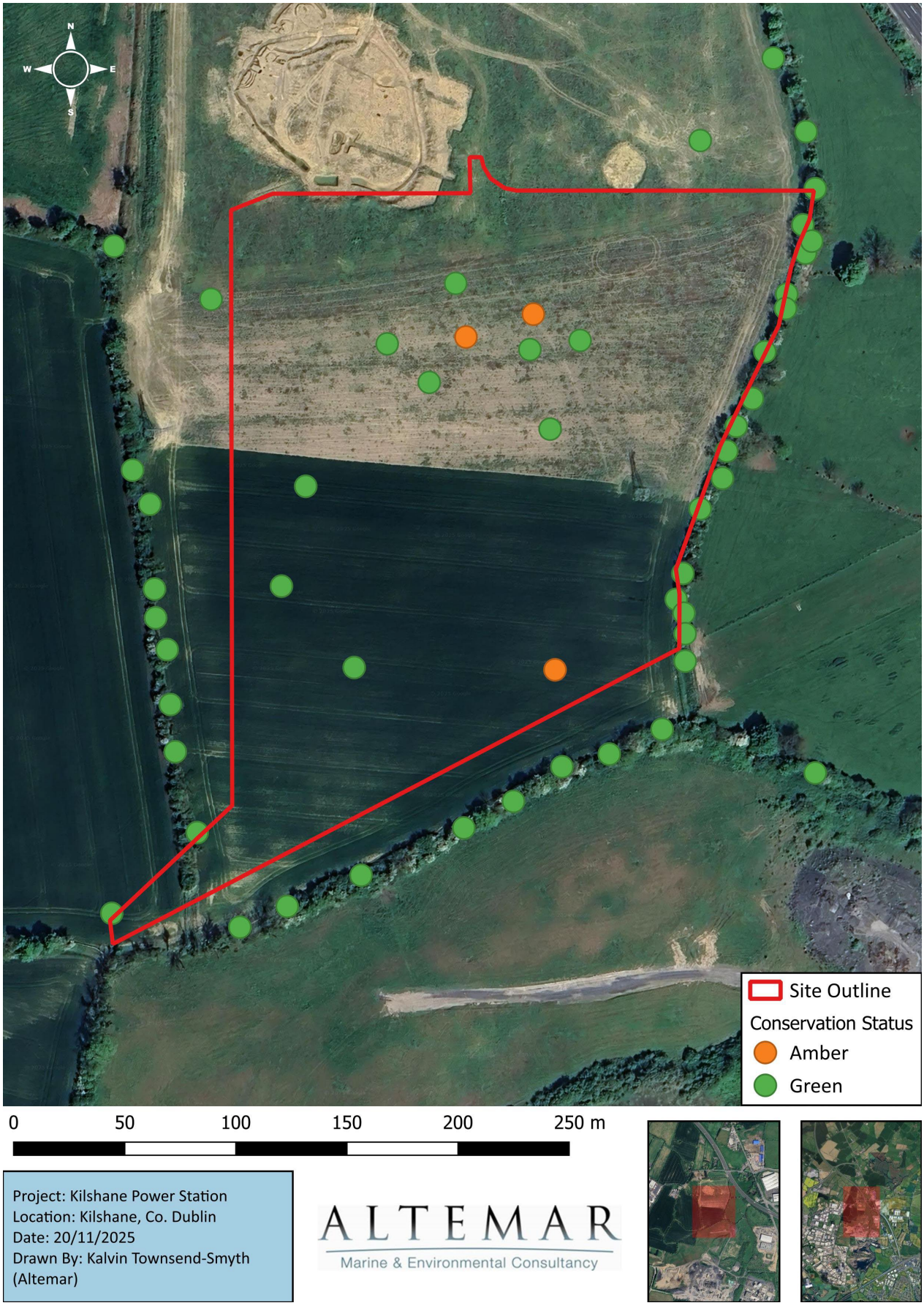
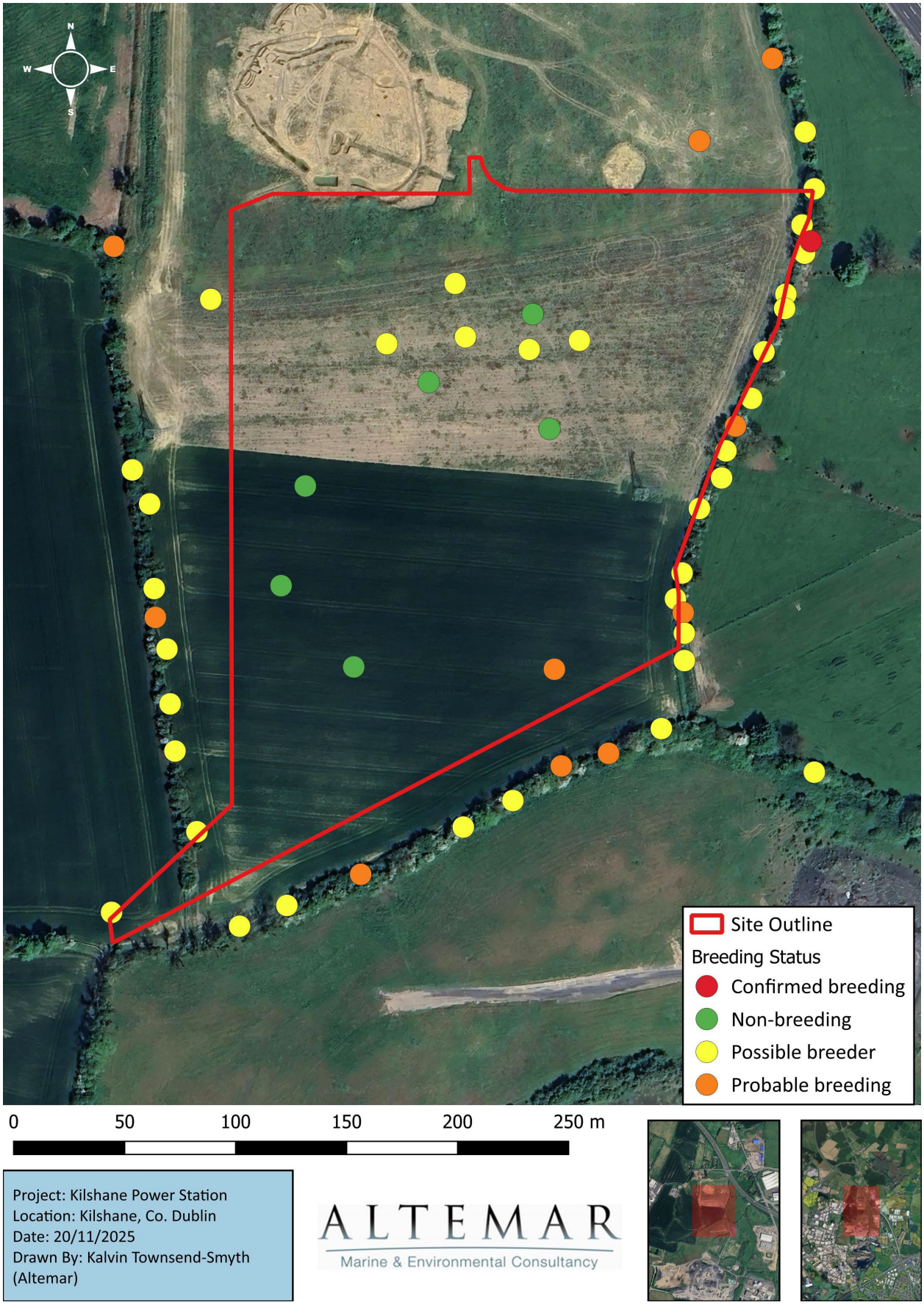


Figure 7-10. Distribution of breeding efforts in birds



7.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

7.4.1 Construction Phase

The key engineering works which will have a potential biodiversity impact including on the hydrological environment during construction of the Proposed Development are summarised below.

- Site clearance and enabling works
- Lighting during the construction and operation of the Proposed Development.
- Construction activities and earthworks will necessitate storage of soils, cementitious 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. Rain events throughout the duration of all earthwork and construction activities poses a risk to biodiversity as run-off carries pollutants into local watercourses (i.e. Huntstown Stream).

7.4.2 Operation Phase

The key engineering works which will have a potential biodiversity impact including on the hydrological environment during construction of the Proposed Development are summarised below.

Foul water drainage will connect to an existing foul water network on Mitchelstown Road through the permitted Phase 1 development (Ref. ABP-317480-23) north of the site, before ultimately being treated along this network under licence.

It is proposed to discharge surface water from the development to an unnamed drainage ditch at an approximate minimum distance of 125 m to the east of the site, which outfalls to the Huntstown Stream Furthermore, it is proposed to incorporate a Storm Water Management Plan through the use of various SuDS techniques to treat and minimise surface water runoff from the site.

The operation of the 2 no. turbines on natural gas, as well as emergency operation on diesel will result in nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (as PM_{10} and $PM_{2.5}$) and sulphur dioxide (SO_2) emissions. Emission modelling (ref Chapter 8 Air section 8.7.2.2) assessed the impact of nitrogen oxides (NO_X), SO_2 and nitrogen and acid deposition emissions at sensitive ecological receptors. The dispersion modelling has determined that concentrations of all pollutants are less than 1% of the relevant critical level or load (as per IN2 Guidance). As per guidance (Chapter 8 Air section 8.3.2.3) there is no requirement for further assessment by the ecologist or for AA Screening and the effect on sensitive ecology can therefore be considered not significant.

7.5 Potential Impacts of the Proposed Development

This report has been prepared to outline the construction and operational phase measures in addition to detailing the potential impacts on sensitive receptors within the Zone of Influence (ZoI).

7.5.1 Construction Phase

In the absence of mitigation measures, the overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora within the site. Direct negative effects will be manifested in terms of the removal of the site's internal habitats, as well as the southern and western perimeter habitats. The removal of the internal habitats will result in a loss of species of low biodiversity importance. Due to the proximity of the Huntstown Stream to the Proposed Development site, there is a risk of water quality impacts resulting from the run-off of contaminated water (e.g. silt and petrochemicals) from the construction site. The area is not deemed to be a significant foraging area for terrestrial mammals or birds. The potential impacts of the proposed construction of the development are outlined below:

7.5.1.1 Designated Conservation sites within 15km

The Proposed Development is not within a designated conservation site. It should be noted that the Proposed Development site is located immediately adjacent to the Huntstown Stream which provides an indirect hydrological connection between the closest European sites, namely Malahide Estuary SAC and SPA, and the subject site at an approximate distance of 9.6 km. The hydrological distance between the subject site and these European sites is *c.* 14 km. The nearest pNHA with a potential indirect hydrological pathway is Malahide Estuary pNHA, located 9.5 km from the subject site, and the nearest Ramsar site is Broadmeadow Estuary (located 14 km downstream).

Due to the site's proximity to the Huntstown Stream, it is considered that there is a hydrological pathway to downstream designated conservation sites. There is the potential for silt and contaminants to drain over land and enter the Huntstown Stream during the construction phase of development. The Huntstown Stream is a tributary of the River Ward, which is is a tributary of the Broadmeadow River which ultimately discharges to the Malahide Estuary. However, given the minimum hydrological distance from the Proposed Development site to this European Site (*c.* 14 km), the scale of the Proposed Development, and the fact that only landscaping works involving planting will be undertaken within *c.* 65 m of the Huntstown Stream, any pollutants, dust or silt laden run off will either infiltrate through the soil, or be dispersed, diluted, and ultimately settle to negligible levels within the Huntstown Stream and the Broadmeadow River prior to reaching downstream designated sites. Therefore, in the absence of mitigation, no significant downstream effects on designated conservation sites are foreseen.

Impacts: Negligible Adverse / International / Negative Impact / Imperceptible / Temporary

No mitigation required.

7.5.1.2 Biodiversity

The impact of the development during construction phase will be a loss of existing habitats and species on site. It would be expected that the flora and fauna associated with these habitats would also be displaced.

7.5.1.3 Terrestrial Mammals

No protected terrestrial mammals were observed on site. No active setts were observed on site. Loss of habitat may affect some common mammalian species.

Impacts: Medium Adverse / National / Negative Impact / Slight Effects / Temporary

Mitigation is needed in the form of a pre-construction survey for terrestrial mammals of conservation importance.

7.5.1.4 Flora

No rare, protected or legally restricted invasive flora were noted on site. Site clearance will remove the flora species on site, resulting in the loss of floral diversity.

Impacts: Low Adverse / Site / Negative Impact / Not Significant / Temporary

No mitigation required.

7.5.1.5 Bats

No bats were detected emerging from any of the on-site trees. No roosting behaviour was observed on site, and foraging activity was low and infrequent. The site is primarily being used by bats for commuting purposes. While activity was generally low, it is possible that bats could establish a roost before demolition or construction activities commence. Despite this, no trees, and therefore potential future roosts, will be lost during the construction of the Proposed Development. However, the provision of artificial lighting during the construction phase could deter bats from the site, potentially fragmenting commuting corridors and limiting access to foraging grounds, as well as potentially illuminating any roosts that may become established before works commence.

Impacts: Low Adverse / International / Negative Impact / Slight Effects / Temporary

Mitigation required.

7.5.1.6 Aquatic Biodiversity

There is the potential for silt and contaminants to drain over land and enter the Huntstown Stream during the construction phase of development. The Huntstown Stream and Ward River are tributaries of the Broadmeadow River which ultimately discharges to the Malahide Estuary. However, given the scale of the Proposed Development, and the fact that only landscaping works involving planting will be undertaken within *c.* 65 m of the Huntstown Stream, most pollutants, dust or silt laden run off is expected to infiltrate through the soil before reaching this watercourse. In the absence of mitigation, and out of an abundance of caution, there is potential for effects on aquatic biodiversity, however, they are not considered to be significant.

Impacts: Low Adverse / Regional / Negative Impact / Slight Effects / Temporary

Mitigation required.

7.5.1.7 Birds

The habitats on site provide suitable foraging habitat for a range of bird species. The treelines that form the perimeter also provide suitable nesting habitat. The site does not provide suitable habitat for any species listed as qualifying interests of the surrounding SPAs. Breeding activity during the surveys was relatively low, with just one green listed species confirmed to be breeding on site, and the presence of amber or red-listed species was rare and infrequent, with a total of three amber listed species noted. The loss of internal habitats will result in the loss of some foraging habitats for local birds. Treelines will be retained, therefore on-site nesting habitat will remain intact.

Impacts: Low adverse / Site / Negative Impact / Not Significant / Temporary

Mitigation is not required.

7.5.2 Operational Phase

Once constructed, the site would be seen as a stable ecological environment that has an overall benefit for biodiversity in the long-term as landscaping matures. As outlined in section 7.4.2 air modelling of emissions has determined that concentrations of all pollutants are less than 1% of the relevant critical level or load (as per IN2 Guidance). As per guidance (Chapter 8 Air section 8.3.2.3) there is no requirement for further assessment by the ecologist or for AA Screening and the effect on sensitive ecology can therefore be considered not significant.

7.5.2.1 Designated Conservation sites within 15km

The provision of SuDs measures in the design of the surface water drainage system will intercept any pollutants carried by surface water run off or allow them to settle before entering the Huntstown River. Should these measures fail in the event of a heavy rainfall event, the hydrological distance between the Proposed Development site and any designated sites is at a far enough distance (*c.* 14 km) that any pollutants will become diluted or settle to negligible levels. Therefore, there will be no negative effects on downstream conservation sites as a result of the operation of the Proposed Development.

Impacts: Negligible Adverse / International / Negative Impact / Imperceptible / Long-term

No mitigation required.

7.5.2.2 Biodiversity

Biodiversity value of the site will improve as landscaping matures.

7.5.2.3 Terrestrial mammals

No protected terrestrial mammals were noted on site. The provision of green spaces as part of the development will have a positive impact on terrestrial mammals in the long term as it provides foraging habitat.

Impacts: Low Beneficial / National / Positive Impact / Slight Effects / Long-term

No mitigation required.

7.5.2.4 Flora

No protected flora or invasive species subject to legal restrictions were noted on site. Considering the provision of green spaces with native planting, the development will have an overall positive effect on flora within the site as landscaping matures.

Impacts: Medium Beneficial / Site / Positive Impact / Moderate Effect / Long-term

No mitigation required.

7.5.2.5 Bats

The Proposed Development will change the local environment as new structures are to be erected and green spaces with native planting will be provided. Newly constructed structures would be clearly visible to bats and would not pose a significant collision risk. The provision of native planting will increase the abundance of prey and roosting potential. While artificial lighting is proposed, which may deter bats from using certain areas of the site, the provided green space along the southern edge of the Proposed Development site will remain unlit. Therefore, the Proposed Development is expected to have a slight beneficial effect on the site for bats in the long-term as landscaping matures.

Impacts: Low Beneficial / International / Positive Impact / Slight Effects / Long-term

No mitigation required.

7.5.2.6 Aquatic Biodiversity

Due to the proposed connection of the surface water drainage system to an unnamed drainage ditch which outfalls to the Huntstown Stream, there is an indirect pathway for pollutants to enter the watercourse. However, considering the provision of a range of SuDs measures in the design of the surface water

drainage system (e.g. swales and petrol interceptors), any potential impacts are considered to be negligible.

Impacts: Negligible Adverse / Regional / Negative Impact / Imperceptible / Long-term

No mitigation required.

7.5.2.7 Birds

The Proposed Development will change the local environment as new structures are to be erected. The structures would be clearly visible to bird species and would not pose a significant collision risk. Additionally, the provision of native planting will increase the abundance of available food and nesting habitat.

Impacts: Medium Beneficial / Site / Positive Impact / Slight Effects / Long-term

No mitigation required.

7.6 Mitigation Measures

7.6.1 Construction Phase

The contractor will be obliged to operate in compliance with a Construction Environmental Management Plan (CEMP). The following mitigation measures will be implemented during the construction phase of the Proposed Development:

- A project ecologist will be appointed to oversee the works and carry out on-site inspections of mitigation measures to ensure they are implemented effectively.
- The watercourses and drainage ditches onsite will be protected from dust, silt, and surface water throughout the works.
- Local silt traps will be established throughout the site during the works, including in the vicinity of all runoff channels to prevent sediment entering the watercourse.
- Stockpiling of loose materials will be kept to a minimum of 40m from watercourses and drainage ditches.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drainage ditches and the watercourse, excavations and other locations where it may cause pollution. Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.
- Petrochemical interception and bunds will also be provided in refuelling areas.
- Any water-filled excavations that require pumping will not directly discharge to the stream. Prior to discharge of water from excavations, adequate filtration will be provided to ensure no deterioration of water quality.
- Maintenance of any drainage structures (e.g. de-silting operations) will not result in the release of contaminated water to the surface water network.
- The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.
- Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis.
- A pre-construction survey will need to be carried out to confirm continued absence of bat roosts and badger setts in advance of the works commencing. If a bat roost is found, a derogation licence will need to be sought from the National Parks and Wildlife Service to allow for the disturbance of any potential future roosts. However, a derogation licence is not required at this stage or if continued absence is confirmed during the pre-construction survey.

- Light spillage on-site into adjacent habitats will be controlled to avoid light contamination of the surrounding treelines. Lighting on site will be subject to approval of the ecologist and during construction will not involve the lighting of the treelines.
- All site clearance works methodologies will have prior approval of a project ecologist.

7.6.2 Operational Phase

Standard operational measures as outlined in the engineering report will be in place to protect surface water networks from pollution. No other mitigation measures are required for the operational phase of the Proposed Development.

7.7 Monitoring or Reinstatement Measures

7.7.1 Construction Phase

A project ecologist will be appointed to oversee construction works on site.

7.7.2 Operational Phase

No operational monitoring/reinstatement is required.

7.8 Residual Effects of the Proposed Development

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the sensitive receptors through the application of standard construction and operational phase controls. The overall impact on the ecology of the Proposed Development will result in a long-term, low beneficial, slight impact on the ecology of the area and locality overall. This is primarily a result of the creation of additional biodiversity features including new greenspaces consisting of native planting.

7.8.1 Construction Phase

Based on the successful implementation of the construction phase controls and the works to be carried out in accordance with this EIAR, it is likely that there will be no significant ecological impact arising from construction works proposed for the proposed project.

A robust series of standard construction phase control measures have been outlined to ensure that the proposed project does not impact on local biodiversity or proximate watercourses during construction. It is essential that these measures are complied with to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the River Ward, which is potentially the primary vector of impacts from the site. No significant adverse impacts on the conservation objectives of designated conservation sites / Natura 2000 sites / European Sites are likely in the absence of mitigation measures outlined above.

A pre-construction survey will be undertaken in advance of the works commencing to confirm continued absence of roosting bats and badger setts.

No significant environmental impacts are likely in relation to the construction of the Proposed Development.

Effects: Low Adverse / Local / Negative Impact / Not significant / Temporary.

7.8.2 Operational Phase

Based on the successful implementation of the operational phase controls and the works to be carried out in accordance with this EIAR, it is likely that there will be no significant ecological impact arising from operation of the proposed project.

Standard operational phase control measures have been outlined to ensure that the proposed project does not impact on local biodiversity or proximate watercourses. It is essential that these measures are complied with, to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the River Ward, which is potentially the primary vector of impacts from the site, is not impacted during operational phases of the Proposed Development.

No significant environmental impacts are likely in relation to the operation of the Proposed Development. The operation of the Proposed Development is expected to have an overall benefit for biodiversity as native planting matures over time.

Effects: Low Beneficial / Local / Positive Impact / Slight Effect / Long-term

7.9 Cumulative Impacts of the Proposed Development

Cumulative Impacts can be defined as "*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

Chapter 2 Section 2.10 summarises the relevant proposed, planned and permitted developments and submitted developments considered during cumulative assessment.

The primary threats, pressures and activities with potential for significant effects on the Natura 2000 sites examined (with High Ranking) are Agriculture, Urbanisation/Human disturbances, Pollution and Natural System modification (primarily modifications in hydrology). All identified potential likely cumulative impacts are associated with change of landuse from greenfield and impacts to air and water.

7.9.1 Construction Phase

Primary potential cumulative impacts on biodiversity from the proposed project cumulatively with other projects were assessed. Principle effects on biodiversity would potentially be seen as a result of air and hydrology impacts from other developments on biodiversity. The cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments with regard to air are considered in Chapter 8 where modelling of existing and permitted developments are assessed in terms of dust. There may be temporary local increases on dust as a result of the overlap of construction of Kilshane Phase 1 (FW22A/0204) and Kilshane Phase 2 (Proposed Development), the proposed development of a 220 kV GIS on Kilshane Road (VA067.314894) and the proposed separate / additional 400kV grid connection required for the Phase 2 development (which will require a future EIAR). All of these projects will require dust control measures during construction and as a result the cumulative impact on ecology will be short term and slight.

In relation to the potential cumulative impact on water bodies during the construction phase, the construction works for all projects listed in Chapter 2 Section 2.10 have been considered. There is potential for cumulative impact on water quality and flow and resultant impact on water habitats as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.

- Contamination of surface water and groundwater from accidental spillage and leakage from construction traffic and construction materials can cause damage to surface water systems and receiving watercourses.

As with the proposed project, the works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect surface water and groundwater quality in compliance with legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and amendments) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and amendments). The implementation of mitigation measures as detailed in Chapter 6 section 6.6 Mitigation Measures as well as section 7.6 Mitigation Measures as well as the compliance of other developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological and hydrogeological environment during the construction phase of the Proposed Development. As the proposed project does not require any water abstraction or diversion of a watercourse there is no potential for cumulative impact on water flow or quantity.

The residual cumulative impact of the Proposed Development on biodiversity in combination with other planned or permitted developments during construction can therefore be considered to be **short-term, not significant and localised**.

7.9.2 Operation Phase

Primary potential cumulative impacts on biodiversity from the proposed project cumulatively with other projects during the operational phase were assessed. Cumulatively there will be a loss of greenfield area locally as part of the development in the area. The proposed additional 400kV grid connection required for the Phase 2 development is expected to be along public roads with minimal impact on areas of biodiversity value. As the proposed developments and other permitted developments on greenfield sites will require landscaping with native species the operation of the developments is expected to have an overall longterm slight cumulative benefit for biodiversity. This is due to the primarily arable nature of the current land use and the native planting within the landscape plan that will mature over time.

The cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments with regard to air quality at habitats are considered in Chapter 8 Air where modelling of existing and permitted developments are assessed in terms of air quality emissions (following IN2 guidance). Cumulative air modelling including existing permitted developments and proposed developments together with the Proposed Development (ref Chapter 8 Air section 8.7.2.2) has resulted in cumulative impact of nitrogen oxides (NO_X), SO_2 and nitrogen and acid deposition emissions at sensitive ecological receptors. The dispersion modelling has determined that concentrations of all pollutants are less than 1% of the relevant critical level or load (as per IN2 Guidance). As per this guidance (Chapter 8 Air section 8.3.2.3) the cumulative effect on sensitive ecology can therefore be considered longterm not significant.

The likely impact on hydrology/hydrogeology are examined comprehensively in Chapter 6 of the EIAR. The impact of existing developments is evident based on assessment of current EPA water body status. The groundwater body is classified as " Good" in the most recent WFD cycle (2019-2024). The Huntstown Stream which belongs to the Ward_030 WFD surface water body is classified as 'Moderate' and is 'At risk of not achieving good status'. This Moderate status relates to the nitrogen (nitrate, specifically) and orthophosphate conditions measured in the Ward River as a result of urban wastewater and agricultural pressures.

There is a low potential of accidental discharges during the operation phase of the proposed or permitted Kilshane developments as the site will be required to operate in compliance with an IED licence which ensures any bulk chemicals and chemical transfer lines are fully contained, interceptors and attenuation are in place and monitoring undertaken prior to discharge to surfacewater. As such no significant likely

impact on the status of the Huntstown Stream, Ward River and Swords groundwater body (GWB) in the long term. All proposed and permitted developments will be required to ensure there developments have design measures in place to protect surface water and groundwater quality in compliance with legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and amendments) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and amendments). As such the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

In light of the cumulative impacts as identified in the Hydrology/Hydrogeology Chapter and cumulative air modelling completed to assess impact on habitats in the Air Chapter of the EIAR, it is concluded that there any no significant cumulative/in combination impact on the Natura 2000 network.

The residual cumulative impact of the Proposed Development on biodiversity in combination with other planned or permitted developments during operation can therefore be considered to be unlikely, short term, **neutral, not significant and long-term**

7.10 References

- Bibby, C. J., Burgess, N. D., Hill, A. H. & Mustoe, S. (2000) Bird Census Techniques.
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine.
- Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines.
- Department of Housing, Planning & Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Environmental Protection Agency (EPA) (2003) Advice Notes on current practice in the preparation of Environmental Impact Assessments.
- Environmental Protection Agency (EPA) (2022) Guidelines of the information to be contained in Environmental Impact Assessment Reports (EIAR)
- European Commission (EC) (2007) Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the Concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence.
- European Commission (EC) (2013a) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- European Commission (EC) (2013b) Interpretation Manual of European Union Habitats.
- European Commission (EC) (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
- European Commission (EC) (2018) Managing Natura 2000 sites.
- European Commission (EC) (2021) Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- Fossitt, J. A. (2000) A Guide to Habitats in Ireland.
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods: A Manual of Techniques for UK Key Species.
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat Mitigation Guidelines for Ireland.
- National Biodiversity Data Centre (NBDC) (2025) Biodiversity maps: https://maps.biodiversityireland.ie/Map
- National Parks and Wildlife Service (NPWS) (2025) Online Map Viewer: https://experience.arcgis.com/experience/edf34d92e28040fd87d3d14f55d8d95f
- National Roads Authority (NRA) (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.

- National Roads Authority (NRA) (2008) Guidelines for Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.
- National Roads Authority (NRA) (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2.
- Smith, G. F., O'Donoghue, O. & Delaney, E. (2011) Best Practice Guidance for Habitat Survey and Mapping.

Chapter 8 – Air Quality

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8. AIR QUALITY

8.1 Introduction

This chapter assesses the likely air quality impacts associated with the construction of the two additional gas turbines, hereafter collectively referred to as the Proposed Development, located at Kilshane Road, Kilshane, Finglas, Dublin 11. A full description of the development is available in Chapter 2 – Description of the Proposed Development.

Kilshane Energy is applying for the construction of two additional gas turbines with an output of 680 Megawatts (MW) to the already permitted Gas Turbine Power Generation Station at the same location. The proposed development will be a continuation of the permitted development of reference FW22A/0204, not yet in construction, which will comprise the construction of the Gas Turbine Power Generation Station.

The permitted development is regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01, which sets out limits and monitoring requirements for noise, air, water, and foul emissions from the Kilshane site. It is anticipated that a licence review will be required to reflect the design changes at the site resulting from the proposed development. The proposed development will operate within the licensed emission limits for the Kilshane site, and that no environmental exceedances are expected to occur as a result of the additional turbines.

8.2 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the proposed development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of this EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the proposed development.

8.2.1 Construction Phase

During the construction stage the main source of air quality effects will be as a result of fugitive dust emissions from site activities. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site.

The proposed works will comprise construction of two additional gas turbines and all associated elements. The key civil engineering works which will have a likely impact on air quality during construction are summarised below:

- During construction, an amount of soil will be generated as part of the site preparation works and during excavation for installation of foundations, drainage services and ancillary infrastructure.
- Infilling and landscaping will be undertaken. Spoil generated during site preparation will be re-used in landscaping and levelling of the site where possible.
- Temporary storage of construction materials.
- Construction traffic accessing the site will emit air pollutants during transport.

As outlined in Section 8.8.1, a Construction Environmental Management Plan (CEMP) will be in place for the construction phase of the project to manage dust and protect nearby sensitive receptors.

8.2.2 Operational Phase

The key works which will have a likely impact on air quality during operation of the Proposed Development are summarised below:

- The operation of the 1 no. permitted turbine, and 2 no. additional turbines will release air pollutant emissions (primarily nitrogen oxides (NO_X), carbon monoxide (CO), sulphur dioxide (SO_2) and particulate matter (as PM_{10} and $PM_{2.5}$).
- Road traffic accessing the site will emit air pollutants and greenhouse gases.

8.3 Assessment Criteria

8.3.1 Human Health

8.3.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

8.3.1.1.1 Air Quality Directive

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. At present, the applicable standards in Ireland include the Air Quality Standards Regulations 2022 (S.I. 739 of 2022), which incorporate EU Directive 2008/50/EC *of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe* (CAFE Directive) (see Table 8.1).

In October 2024 the EU enacted Directive (EU) 2024/2881 *of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast)*. This directive supersedes EU Directive 2008/50/EC and it sets out new air quality standards for pollutants to be reached by 2030 which are more closely aligned with the World Health Organisation (WHO) air quality guidelines. The revised limit values outlined in Directive 2024/2881 are applicable from 1st January 2030 and as such are not applicable to the facility. The current ambient air quality standards and limit values set out in Directive 2008/50/EC are the appropriate limits for assessing compliance of the facility.

Ambient air quality legislation designed to protect human health and the environment is generally based on assessing ambient air quality at locations where the exposure of the population is significant relevant to the averaging time of the pollutant. However, in the current assessment, ambient air quality legislation has been applied to all locations within 10 km of the facility regardless of whether any sensitive receptors (such as residential locations) are present. This represents a worst-case approach and an examination of the corresponding concentrations at the nearest sensitive receptors relative to the actual quoted maximum concentration indicates that these receptors generally experience ambient concentrations significantly lower than that reported for the worst-case location.

The ambient air quality standards applicable for the current assessment to determine the potential impact of NO_2, CO, PM_{10} and $PM_{2.5}$ on ambient air quality are outlined in Table 8.1.

Table 8.1. CAFE Directive Ambient Air Quality Limit Values

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030) [a]	Limit Type	Limit Value (to be attained by 2030) [a]
Nitrogen Dioxide (NO_2)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m^3
	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Nitrogen Oxides (NO_X)	Critical level for protection of vegetation (Annual)	30 µg/m^3	Critical level for protection of vegetation (Annual)	30 µg/m^3
Carbon Monoxide (CO)	8-hour limit (on a rolling basis) for protection of human health	10 mg/m^3	8-hour limit (on a rolling basis) for protection of human health	10 mg/m^3
	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	4 mg/m^3
Particulate Matter (as PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as $PM_{2.5}$)	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m^3
	Annual limit for protection of human health	25 µg/m^3	Annual limit for protection of human health	10 µg/m^3

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030) [a]	Limit Type	Limit Value (to be attained by 2030) [a]
Sulphur dioxide (SO_2)	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	350 µg/m^3	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	350 µg/m^3
	24-hour limit for protection of human health - not to be exceeded more than 3 times/year	125 µg/m^3	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m^3
	n/a	n/a	Annual limit for protection of human health	20 µg/m^3
	Annual limit value for the protection of vegetation	20 µg/m^3	Annual limit value for the protection of vegetation	20 µg/m^3

a. Note µg/m^3 (micrograms per cubic metre).

8.3.1.1.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (Table 13-2), the IT4 targets by 2030 and the final targets by 2040 (Table 13-2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m^3. The strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*".

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that *"Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II."*

These assessment thresholds relate to monitoring of ambient air quality by Member States, where *"exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years."*

Table 8.2 WHO Air Quality Guidelines 2021

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	24-hour limit for protection of human health	-	-	25 µg/m^3
	Annual limit for protection of human health	20 µg/m^3	-	10 µg/m^3
PM (as PM_{10})	24-hour limit for protection of human health	75 µg/m^3	50 µg/m^3	45 µg/m^3
	Annual limit for protection of human health	30 µg/m^3	20 µg/m^3	15 µg/m^3
PM (as $PM_{2.5}$)	24-hour limit for protection of human health	37.5 µg/m^3	25 µg/m^3	15 µg/m^3
	Annual limit for protection of human health	15 µg/m^3	10 µg/m^3	5 µg/m^3

The applicable air quality limit values for the purposes of this assessment are those set out in Table 8.1. The limit values stipulated under Directive (EU) 2024/2881 Annex I Table 2 and the Air Quality Standards Regulations 2022 are applicable for the proposed development as it will be constructed and operational prior to 2030.

8.3.1.1.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 8.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards 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. Furthermore, no criteria have been stipulated for nuisance dust for this specific type of proposed development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

8.3.1.1.4 Industrial Emissions Directive and Large Combustion Plant Directive

The Industrial Emissions Directive (IED) (Directive 2010/75/EU) was adopted on 7 January 2013 and is the key European Directive which covers the regulation of the majority of processes in the EU. As part of the IED Article 15, paragraph 2, requires Emissions Limit Values (ELVs) are based on best available techniques (BAT) and the relevant sector Reference Document of Best Available Techniques (BREF documents).

The most relevant BAT sector document for the activities at the installation is the Commissions Implementing Decision (EU) 2021/2326 of 30 November 2021 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants. The BAT for LCP applies to plants with a rated thermal input of 50 MW_{th} or more, and is therefore applicable to the dual fuel turbine.

The turbines are anticipated to operate in excess of 500 hours per annum using natural gas as an OCGT and thus the emissions will need to comply with the ELVs outlined in BAT 44 and Table 24 of the LCP BAT. Daily average and yearly average ELVs are pre proposed for NO and CO as follows:

- NO_X: 50 mg/Nm^3 (daily average) and 35 mg/Nm^3 (yearly average); and
- CO: 100 mg/Nm^3 (daily average) and 40 mg/Nm^3 (yearly average).

The use of liquid fuel by the turbines is for emergency back-up only and the turbines are not anticipated to operate in excess of 500 hours per annum using this fuel. Therefore, the emergency operation of the turbines as proposed is exempt from complying with the LCP BAT ELVs.

The emissions concentrations for NO_X and CO utilised for dispersion modelling have been derived from the daily average ELVs, as a conservative basis for determining air quality impacts. The daily average ELVs are higher than the yearly average ELVs and are therefore a conservative basis for determining air quality impacts. The dispersion model results presented in Section 8.7.2, based on the daily average ELVs, are the maximum ambient concentrations expected as a result of the facility. In reality, compliance with the yearly average ELVs will result in lower emissions and lower ambient concentrations than those presented in Section 8.7.2.

8.3.2 Ecology

8.3.2.1 Critical Levels

Directive (EU) 2024/2881 and the Air Quality Standards Regulations 2022 outline an annual critical level of 30 µg/m^3 for NO_X (Table 8.1) for the protection of vegetation and natural ecosystems in general. Directive (EU) 2024/2881 defines 'Critical Levels' as "*a level above which direct adverse effects can occur on some receptors, such as trees, other plants or natural ecosystems but not on humans*".

8.3.2.2 Critical Loads

A 'Critical Load' is defined by the United Nations Economic Commission for Europe (UNECE) as *"a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge"* (UNECE, 2003).

Critical loads are presented as a range, within which there is the potential for effects on sensitive ecological receptors. Critical load ranges for N deposition and acid deposition were derived from the Air Pollution Information System (APIS) website (APIS, 2025) and are reproduced as shown in Table 8.4 and Table 8.5. Also shown in these tables are the site feature code and name (i.e. the qualifying feature the site is designated for), the corresponding critical load class and EUNIS codes (European Nature Information System (EUNIS) by the European Environment Agency). The methodology for identifying the relevant sensitive ecological receptors shown in Table 8.4 and Table 8.5 is discussed in Section 8.5.3.2.2.

Critical loads are only available for internationally designated habitats (Special Protection Area (SPA) and Special Area of Conservation (SAC)), and for nationally designated Natural Heritage Areas (NHA).

8.3.2.2.1 Nitrogen Deposition Critical Loads

In order to determine the appropriate nitrogen deposition critical load, and in addition to APIS, the EPA publication *Research 390: Nitrogen-Sulfur Critical Loads: Assessment of the Impacts of Air Pollution on Habitats* (EPA, 2021) was consulted. In *Table 3.2* of *Research 390*, empirical critical loads ($CL_{emp}N$ ABR) of nutrient nitrogen are outlined with a worst-case range of 5-10 kgN/ha/yr for certain habitat types. These have been reproduced below in Table 8.3. Where the $CL_{emp}N$ ABR is underlined in *Table 3.2* of *Research 390*, the lower limit of the critical load range should be used. Where there is no underlining of the $CL_{emp}N$ ABR, the midpoint can be used to define the critical load for specific habitat types.

APIS and *Table 3.2* of *Research 390* both specify EUNIS codes for habitat types. APIS was reviewed for the sensitive features (i.e. habitat types) within each designated site, and their EUNIS codes compared against those given in *Table 3.2* of *Research 390*. Where a feature's EUNIS code was specifically listed in *Table 3.2* of *Research 390*, the recommended critical load from this report table was used for this assessment. This was either the mid-range critical load or the lower load of the range as determined by the rules outlined in the above paragraph.

Where there are habitat types which are not specified in *Table 3.2* of *Research 390*, the lower critical load of the range outlined in APIS is used as a worst-case.

The resulting lowest critical loads used to compare with modelled process contributions are shown in Table 8.4, and are termed assessment criteria.

Table 8.3. Empirical Critical Loads for Nutrient Nitrogen Deposition Reproduced from Table 3.2 of Research 390 (EPA, 2021)

Annex I Code	EUNIS Code 2007 [a]	$CL_{emp}N$ ABR
1xxx [b]	A2.5x	5 – 10
21xx [c]	B1.x [N]	5 – 10
4010	F4.11 [S]	5 – 10
4030	F4.2 [S	5 – 10
4060	F2.2 [S]	5 – 10
5130 [c]	F3.16 [S]	5 – 10
6210	E1.26 (E1.2) [R]	5 – 10
6230	E1.7 (E1.71) [R]	5 – 15
6410	E3.51 [R]	5 – 15
6430	E5.5 [R]	5 – 15
6510	E2.2 [R]	5 – 15
7110 [e]	D1.11 [Q]	5 – 15
7130	D1.22 [Q]	5 – 10
7230	D4.1 [Q]	5 – 10
8220	H3.1	5 – 10
8240	H3.511	5 – 10
91A0	G1.83 [T]	10 – 15

a. Parentheses indicate alternative crosswalk correspondence between Annex I and EUNIS and square brackets indicate the EUNIS 2020 code letter.
b. Salt marshes (1310, 1330, 1410).
c. Sand dunes (2110, 2120, 2130, 2170, 2190, 21A0).
d. Juniperus communis formations, similar results for acidic and calcareous vegetation groups; Juniperus communis was one of the species that showed a decrease (z–) in abundance; bryophytes were not recorded in the survey.
e. Species abundance included only 15 indicator species

8.3.2.2.2 Acid Deposition Critical Loads

Acid deposition critical loads are further categorised by nitrogen (N) or sulphur (S) components. Modelled acid deposition process contributions are therefore calculated in terms of both nitrogen (N) and sulphur (S) (see Section 8.4.2.3).

Deposition of sulphur (as sulphate (SO_4^{2-})) and nitrogen (as nitrate (NO_3^-), ammonium (NH_4^+) and nitric acid (HNO_3^-)), can cause acidification and both sulphur and nitrogen compounds must be taken into account when assessing acidification of soils. For the purposes of determining links between critical loads and atmospheric emissions of sulphur and nitrogen, critical loads are further derived to produce a maximum critical load for sulphur (CLmaxS), a minimum critical load for nitrogen (CLminN) and a maximum critical load for nitrogen (CLmaxN). These components define the critical load function and when compared with deposition data for sulphur and nitrogen, they can be used to assess critical load exceedances.

The modelled acid deposition process contributions (as S) have been compared to the minimum critical load (S) (MinCLmaxS).

The modelled acid deposition process contributions (as N) have been compared to the minimum critical load (N) (MinCLminN). Where a process contribution is greater than 1% of this minimum critical load, the predicted environmental concentration (PEC) should then be calculated by adding the acid deposition background concentration to the process contribution. The PEC should then be compared to the lower end of the maximum critical load (N) range i.e. MaxCLminN. This is in line with the *Screening Acidity Critical Loads* approach taken by APIS (available as a tab in the APIS app) for designated sites. Notably, APIS does not consider the critical load function to be exceeded unless the PEC is larger than the maximum critical load, not the minimum (which is typically considered worst case).

Table 8.4. Critical Loads for Nitrogen Deposition

Ecological Receptor		Feature Code	Feature Name	Critical loads for most sensitive feature*			Nitrogen Critical Load Class	EUNIS code	Is species sensitive due to nutrient nitrogen impacts on broad habitat?	Reason
Site Name	Site Code			Min. Critical Load for N (kg N/ha/yr)	Max. Critical Load for N (kg N/ha/yr)	Assessment Criteria				
Natura 2000										
Malahide Estuary SAC	000205	H2120	Shifting dunes along the shoreline with Ammophila arenaria (white dunes)	5	10	5	Shifting coastal dunes	B1.3	n/a	n/a
Malahide Estuary SPA	004025	A005	Podiceps cristatus (North-western Europe - wintering)	5	10	7.5	Pioneer, low-mid, mid-upper saltmarshes	A2.54; A2.55; A2.53	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
		A142	Pluvialis apricaria [North-western Europe]	5	10	7.5	Pioneer, low-mid, mid-upper saltmarshes	A2.54; A2.55; A2.53	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
South Dublin Bay and River Tolka Estuary SPA	004024	A192	Sterna dougallii (Europe - breeding)	5	10	7.5	Shifting coastal dunes	B1.3	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
		A193	Sterna hirundo (Northern/Eastern Europe - breeding)	5	10	5	Shifting coastal dunes	B1.3	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
		A194	Sterna paradisaea (Arctic - breeding/Southern Oceans - wintering)	5	10	5	Shifting coastal dunes	B1.3	Yes	Potential negative impact on species due to impacts on the species' broad habitat.

Ecological Receptor		Feature Code	Feature Name	Critical loads for most sensitive feature*			Nitrogen Critical Load Class	EUNIS code	Is species sensitive due to nutrient nitrogen impacts on broad habitat?	Reason
Site Name	Site Code			Min. Critical Load for N (kg N/ha/yr)	Max. Critical Load for N (kg N/ha/yr)	Assessment Criteria				
		A195	Sterna paradisaea (Arctic - breeding/Southern Oceans - wintering)	5	10	5	Northern wet heath: Erica tetralix dominated wet heath	F4.11	Yes	Potential negative impact on species due to impacts on the species' broad habitat.

Table 8.5. Critical Loads for Acid Deposition

Site Name	Site Code	Feature Code	Feature Name	Acidity Critical Load Class	Max. Critical Load Range (N) (keq/ha/yr)		Max. Critical Load (S) (keq/ ha/yr)	Min. Critical Load Range (N) (keq/ ha/yr)		Min. Critical Load (S) (keq/ ha/yr)	Is species sensitive due to acidity impacts on broad habitat?	Reason
					MaxCL minN	MaxCL maxN	MaxCL maxS	MinCL minN	MinCL maxN	MinCL maxS		
Natura 2000												
Malahide Estuary SAC	000205	H2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Acid grassland	0.714	5.007	4.293	0.143	4.26	4.117	-	-
				Calcareous grassland	0.714	5.007	4.293	0.143	4.26	4.117	-	-
Malahide Estuary SPA	004025	A005	Podiceps cristatus (North-western Europe - wintering)	Freshwater	0.714	5.007	4.293	0.143	4.26	4.117	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
South Dublin Bay and River Tolka Estuary SPA	004024	A193	Sterna hirundo (Northern/ Eastern Europe - breeding)	Acid grassland	0.714	4.919	4.205	0.143	4.242	4.099	Yes	Potential negative impact on species due to impacts on the species' broad habitat.
				Freshwater	0.714	4.919	4.205	0.143	4.242	4.099		
				Calcareous grassland	0.714	4.919	4.205	0.143	4.242	4.099		

8.3.2.3 Ecology Significance Criteria

Annual mean NO_X concentrations, nitrogen and acid deposition are compared to the relevant critical levels and loads in line with IAQM (IAQM, 2020), UKEA (UKEA, 2025) and EPA (EPA, 2024b) guidance. As per this guidance, where the (PC) of a pollutant emitted from a facility is less than 1% of the relevant critical level and critical load the further assessment is not required and the effect on ecology can be considered not significant.

In October 2024, the EPA published the draft guidance Licence Application Instruction Note 2 (IN2) (DRAFT): Assessing the Impact of Ammonia Emissions to Air and Nitrogen Deposition from EPA licensable activities on European Sites (hereafter referred to as IN2).

IN2 and the flowchart shown in Figure 8.1 (reproduced from Appendix 1 of IN2) is designed to assist in determining the course of action to be taken when evaluating the impacts on European sites (Special Areas of Conservation (SACs) Special Protection Areas (SPAs)) and of ammonia emissions to air and nitrogen deposition from main air emission points at EPA licensable industrial sites (Industrial Emissions, Integrated Pollution Control and Waste), excluding intensive agriculture installations, for the purposes of an Appropriate Assessment (AA). This approach may also be applied to NO_X specifically in the context of AA.

The methodology from IN2 and the flowchart steps are considered appropriate for determining ecological impacts from a variety of air pollutant emission sources on European Sites, and have therefore been applied in this assessment:

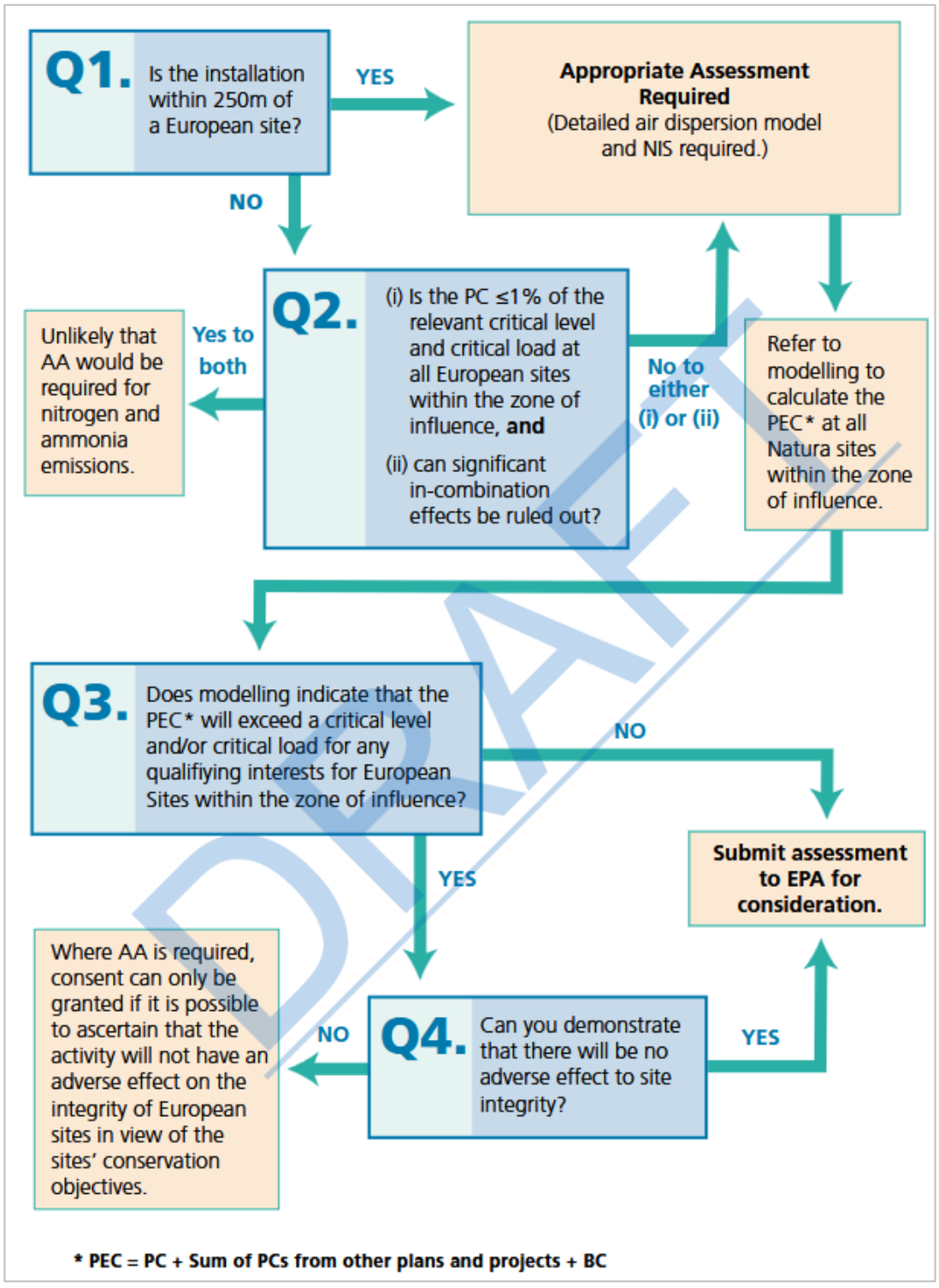
1. The installation is not within 250 m of a European site. Proceed to Q2.
2. (i) Is the process contribution (PC) ≤1% of the relevant critical level and critical load at all European sites within the zone of influence, and (ii) can significant in-combination effects be ruled out?
    - PCs have been compared to the relevant critical levels and critical loads. The results of this screening exercise are presented in Section 8.7.1.3.

As per the IN2 guidance, where a PC is greater than 1% of the critical level, this site has been included in further assessment, where the PEC is determined by combining the background concentration with the PC. If a PC is less than the 1% threshold then the IN2 guidance states *"emissions are not considered to be likely to have a significant effect on European sites. No need to progress to further questions. Submit application to EPA for consideration".* "Further questions" refers to Question 3 in the IN2 guidance, which states "*Does modelling indicate that the PEC will exceed a critical level and/or critical load for any relevant qualifying interests for European sites within the zone of influence?"*. Calculation of PECs is therefore only technically required if Question 3 requires addressing i.e. if PCs are >1% threshold.

If there are no PCs greater than 1% of the critical level at any of the modelled European sites, no further assessment (i.e. calculation of PEC) is required as per IN2 guidance.

The IN2 process applies specifically to European sites with international designation, namely Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). However, the same approach has been taken to assess the effect of emissions impacts on nationally designated sites such as Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). SACs and SPAs are protected under the EU Habitats Directive (92/43/EEC), and EU Birds Directive (2009/147/EC) respectively, and are also known as Natura 2000 sites. NHAs are designated under the Wildlife (Amendment) Act 2000, and pNHAs were identified as sites of conservation interest in the 1990s but have not since been statutorily proposed or designated.

Figure 8.1 IN2 flowchart for assessing the impacts of nitrogen deposition and ammonia emissions to air on European Sites



DRAFT

8.4 Methodology

8.4.1 Construction Phase

8.4.1.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) 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 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 recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The IAQM states that as assessment of construction dust impacts is normally required where there is a human or ecological receptor within 250m of the boundary of the site (this should consider offsite construction compounds) and/or within 50 m of the route(s) used by construction vehicles on the public road network (on roads up to 250 m from the site entrance). This constitutes the Zone of Influence (ZoI) for the construction dust assessment.

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

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 criteria for determining the category for the works involved are outlined in Table 8.6, these are based on the IAQM guidance (IAQM, 2024). 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. The magnitude of each dust generating activity is established in Section 8.7.1.1.1 as part of the impact assessment.

Table 8.6 IAQM Criteria to Determine Dust Emissions Magnitude

Dust Emission Magnitude		
Small	**Medium**	**Large**
Demolition		
• Total building volume <12,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <6 m above ground • Demolition during wetter months	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material • Demolition activities 6 – 12 m above ground level	• Total building volume >75,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >12 m above ground level
Earthworks		

Dust Emission Magnitude		
Small	**Medium**	**Large**
• Total site area <18,000 m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <3 m in height • Earthworks during wetter months	• Total site area 18,000 m^2 - 110,000 m^2 • Moderately dusty soil type (e.g. silt) • 5 – 10 heavy earth moving vehicles active at any one time • Formation of bunds 3 – 6 m in height	• Total site area >110,000 m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6 m in height
Construction		
• Total building volume <12,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >75,000 m^3 • On-site concrete batching • Sandblasting
Trackout (Truck Movements)		
• <20 HDV (>3.5 t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50 m	• 20 – 50 HDV (>3.5 t) outward movements in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 – 100 m	• >50 HDV (>3.5 t) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m

Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 8.7. The level of risk of each dust generating activity is established in Section 8.7.1.1.2 as part of the impact assessment.

Table 8.7 IAQM Criteria to Determine Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
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			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

8.4.1.2 Construction Phase Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), 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. While the guidance is specific to infrastructure projects, the approach 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;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

As per Chapter 13 Traffic and Transportation of this EIAR, it has been determined by the traffic consultant that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT. The construction stage traffic has been reviewed, and it has been determined that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT; additionally, the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality 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 with respect with human or ecological receptors.

8.4.2 Operational Phase

8.4.2.1 Operational Phase Traffic Assessment

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 8.4.1.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment.

As per Chapter 13 Traffic and Transportation of this EIAR, it has been determined by the traffic consultant that the proposed development will not result in the operational phase traffic increasing by more than 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 (Section 8.4.1.2). A detailed air quality assessment of operational phase traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to local air quality with respect with human or ecological receptors.

8.4.2.2 Air Dispersion Modelling Methodology

The United States Environmental Protection Agency (USEPA) approved AERMOD dispersion model has been used to predict the ground level concentrations (GLC) of pollutants emitted from the principal emission sources on-site.

The modelling incorporated the following features:

- All on-site buildings and significant process structures were mapped into the computer to create a three dimensional visualisation of the site and its emission points. Buildings and process structures can influence the passage of airflow over the emission stacks and draw plumes down towards the ground (termed building downwash). The stacks themselves can influence airflow in the same way as buildings by causing low pressure regions behind them (termed stack tip downwash). Both building and stack tip downwash were incorporated into the modelling.
- Detailed terrain has been mapped into the model using SRTM data with 30m resolution. The site is located in an area of complex terrain. All terrain features have been mapped in detail into the model using the terrain pre-processor AERMAP (USEPA, 2017).
- Hourly-sequenced meteorological information has been used in the model. Meteorological data over a five year period (Dublin Airport 2020 – 2024) was used in the model (see Section 8.5.1 and Appendix 8.1).
- The source and emissions data, including stack dimensions, gas volumes and emission temperatures have been incorporated into the model.

8.4.2.2.1 NO_X to NO_2 Conversion

The Plume Volume Molar Ratio Method (PVMRM) was used to model NO_2 concentrations. The PVMRM is a regulatory option in AERMOD which assumes that the amount of NO converted to NO_2 is proportional to the ambient ozone concentration (Hanrahan, 1999a; Hanrahan 1999b). The PVMRM uses both plume size and O_3 concentration to derive the amount of O_3 available for the reaction between NO and O_3. NO_X moles are determined by emission rate and travel time through the plume segment. The concentration is usually limited by the amount of ambient O_3 that is entrained in the plume. Thus, the ratio of the moles of O_3 to the moles of NO_X gives the ratio of NO_2/NO_X that is formed after the NO_X leaves the stack. The equation used in the algorithm to derive the ratio of NO_2/NO_X gas combustion is:

$$NO_2/NO_X = (\text{moles } O_3/ \text{ moles } NO_X) + 0.10$$

An initial NO_2/NO_X ratio of 0.1 for the RTO was assumed for the purposes of this assessment.

8.4.2.2.2 Terrain

The terrain across the 3 x 3 km domain modelled has been illustrated as contours in Figure 8.2.

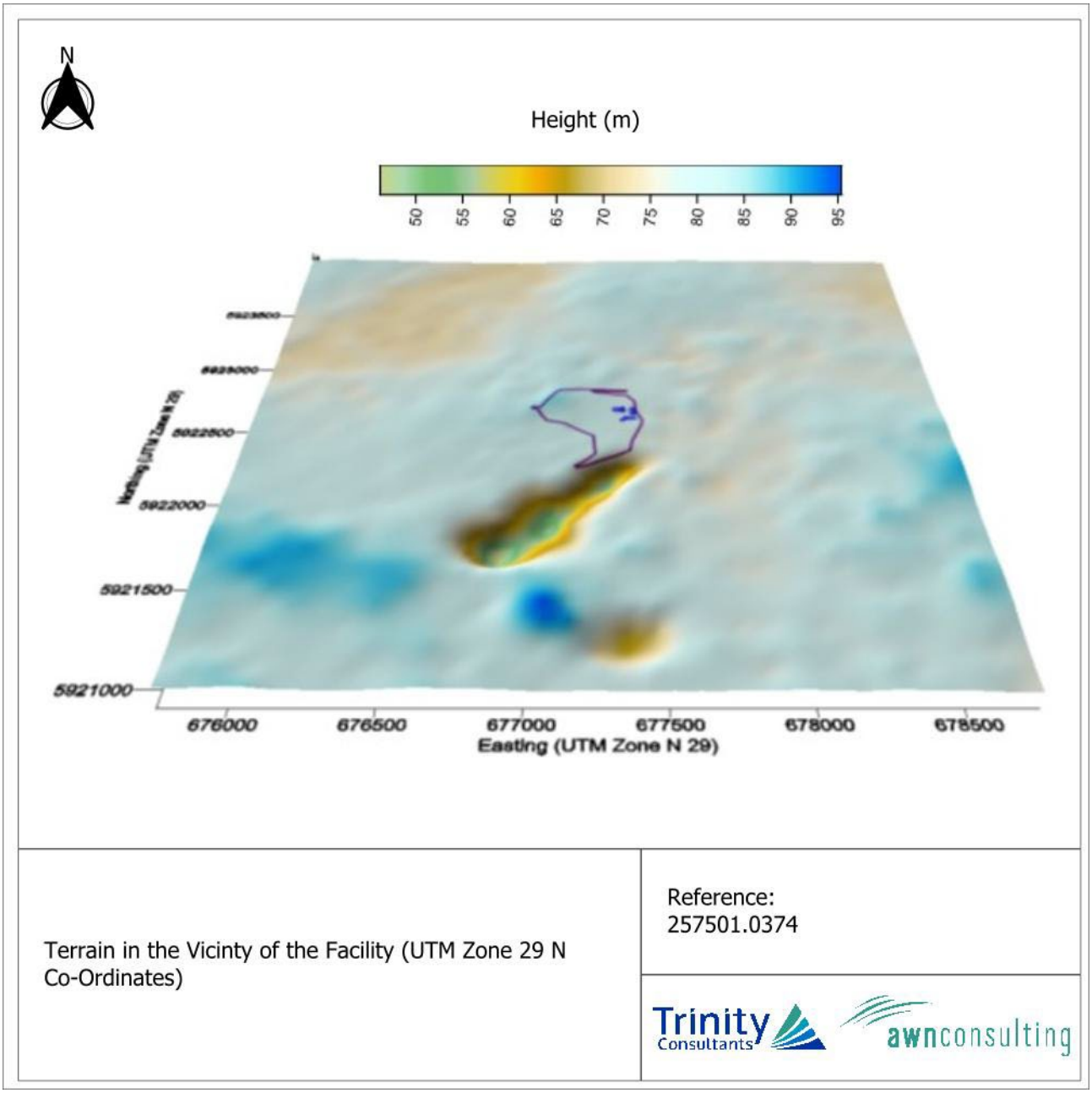
The AERMOD air dispersion model has a terrain pre-processor AERMAP (USEPA, 2017) which was used to map the physical environment in detail over the receptor grid. The digital terrain input data used in the AERMAP pre-processor was obtained from SRTM. This data was run to obtain for each receptor point the terrain height and the terrain height scale. The terrain height scale is used in AERMOD to calculate the critical dividing streamline height, H_{crit}, for each receptor. The terrain height scale is derived from the Digital Elevation Model (DEM) files in AERMAP by computing the relief height of the DEM point relative to the height of the receptor and determining the slope. If the slope is less than 10%, the program goes to the next DEM point. If the slope is 10% or greater, the controlling hill height is updated if it is higher than the stored hill height.

In areas of complex terrain, AERMOD models the impact of terrain using the concept of the dividing streamline (H_c). As outlined in the AERMOD model formulation (USEPA, 2022) a plume embedded in the

flow below H_c tends to remain horizontal; it might go around the hill or impact on it. A plume above H_c will ride over the hill. Associated with this is a tendency for the plume to be depressed toward the terrain surface, for the flow to speed up, and for vertical turbulent intensities to increase.

AERMOD model formulation states that the model "captures the effect of flow above and below the dividing streamline by weighting the plume concentration associated with two possible extreme states of the boundary layer (horizontal plume and terrain-following). The relative weighting of the two states depends on: 1) the degree of atmospheric stability; 2) the wind speed; and 3) the plume height relative to terrain. In stable conditions, the horizontal plume "dominates" and is given greater weight while in neutral and unstable conditions, the plume traveling over the terrain is more heavily weighted" (USEPA, 2005).

Figure 8.2 Terrain in the Vicinity of the proposed development



8.4.2.2.3 Geophysical Considerations

AERMOD simulates the dispersion process using planetary boundary layer (PBL) scaling theory (USEPA, 2022). PBL depth and the dispersion of pollutants within this layer are influenced by specific surface characteristics such as surface roughness, albedo and the availability of surface moisture. Surface roughness is a measure of the aerodynamic roughness of the surface and is related to the height of the roughness element. Albedo is a measure of the reflectivity of the surface whilst the Bowen ratio is a measure of the availability of surface moisture.

AERMOD incorporates a meteorological pre-processor AERMET (USEPA, 2018) to enable the calculation of the appropriate parameters. The AERMET meteorological pre-processor requires the input of surface characteristics, including surface roughness (z_0), Bowen Ratio and albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. The values of albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use type was carried out to a distance of 10 km from the meteorological station for Bowen Ratio and albedo and to a distance of 1 km for surface roughness in line with USEPA recommendations (USEPA, 2008; 2018) as outlined in Appendix 8.1.

In relation to AERMOD, detailed guidance for calculating the relevant surface parameters has been published (USEPA, 2008). The most pertinent features are:

- The surface characteristics should be those of the meteorological site rather than the installation;
- Surface roughness should use a default 1 km radius upwind of the meteorological tower and should be based on an inverse-distance weighted geometric mean. If land use varies around the site, the land use should be sub-divided by sectors with a minimum sector size of 30º;
- Bowen ratio and albedo should be based on a 10 km grid. The Bowen ratio should be based on an un-weighted geometric mean. The albedo should be based on a simple un-weighted arithmetic mean.

AERMOD has an associated pre-processor, AERSURFACE (USEPA, 2008) which has representative values for these parameters depending on land use type. The AERSURFACE pre-processor currently only accepts NLCD92 land use data which covers the USA. Thus, manual input of surface parameters is necessary when modelling in Ireland. Ordnance survey discovery maps (1:50,000) and digital maps such as those provided by the EPA, National Parks and Wildlife Service (NPWS) and Google Earth® are useful in determining the relevant land use in the region of the meteorological station. The Alaska Department of Environmental Conservation has issued a guidance note for the manual calculation of geometric mean for surface roughness and Bowen ratio for use in AERMET (ADEC, 2008). This approach has been applied to the current site with full details provided in Appendix 8.1.

8.4.2.2.4 Building Downwash

When modelling emissions from an industrial installation, stacks which are relatively short can be subjected to additional turbulence due to the presence of nearby buildings. Buildings are considered nearby if they are within five times the lesser of the building height or maximum projected building width (but not greater than 800 m).

The USEPA has defined the "Good Engineering Practice" (GEP) stack height as the building height plus 1.5 times the lesser of the building height or maximum projected building width. It is generally considered unlikely that building downwash will occur when stacks are at or greater than GEP (USEPA, 1985).

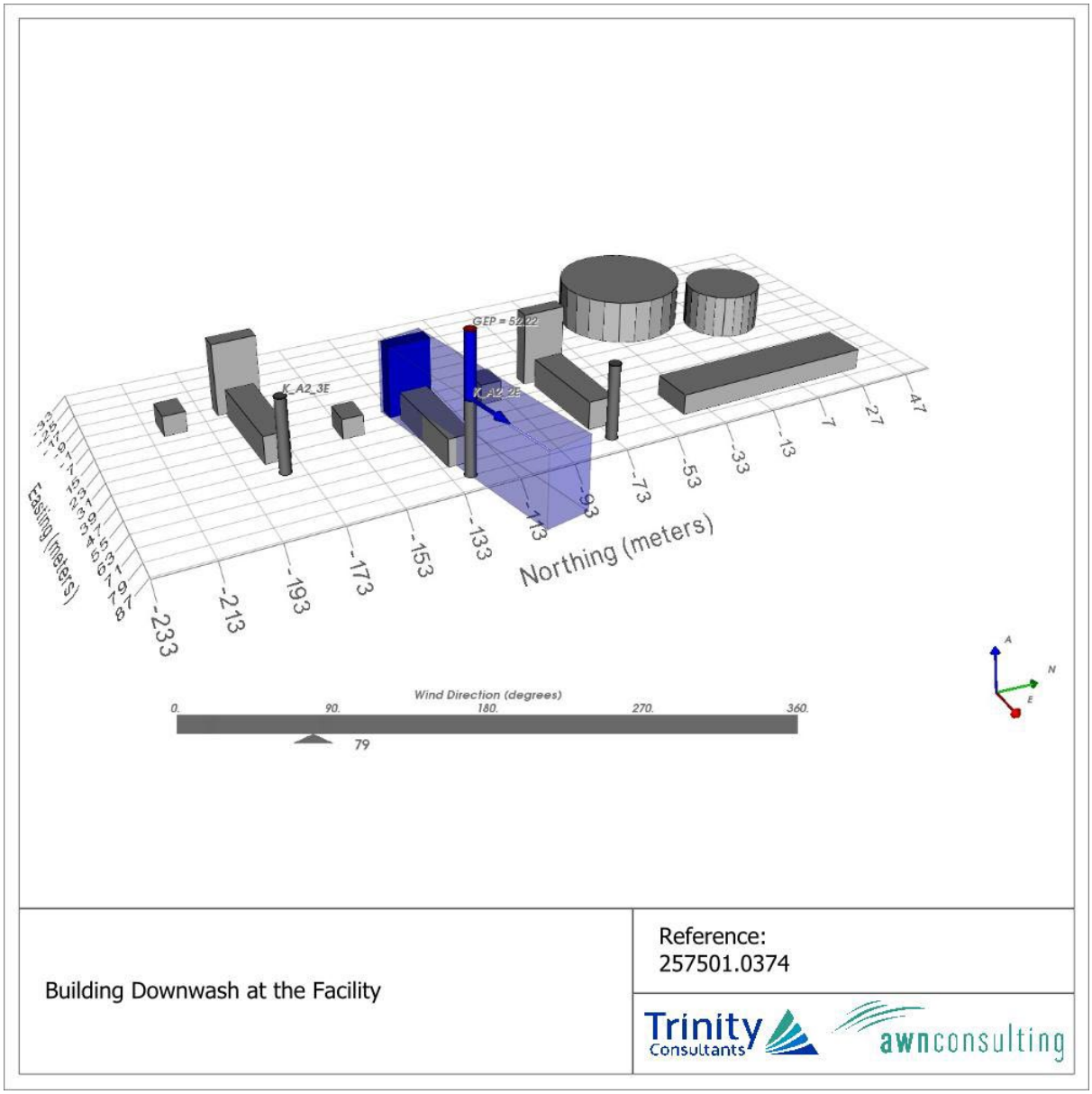
When stacks are less than this height, building downwash will tend to occur. As the wind approaches a building it is forced upwards and around the building leading to the formation of turbulent eddies. In the lee of the building these eddies will lead to downward mixing (reduced plume centreline and reduced plume rise) and the creation of a cavity zone (near wake) where re-circulation of the air can occur. Plumes

released from short stacks may be entrained in this airflow leading to higher ground level concentrations than in the absence of the building.

The Plume Rise Model Enhancements (PRIME) (Paine & Lew, 1997a; 1997b) plume rise and building downwash algorithms, which calculates the impact of buildings on plume rise and dispersion, have been incorporated into AERMOD. The building input processor BPIP-PRIME produces the parameters which are required in order to run PRIME. The model takes into account the position of each stack relative to each relevant building and the projected shape of each building for 36 wind directions (at 10º intervals). The model determines the change in plume centreline location with downwind distance based on the slope of the mean streamlines and coupled to a numerical plume rise model (Paine & Lew, 1997a).

Given that the stacks are less than 2.5 times the lesser of the building height or maximum projected building width, building downwash will need to be taken into account and the PRIME algorithm run prior to modelling with AERMOD. Shown in Figure 8.3 is an example of the buildings (in blue) which influence the building downwash for stack A2-2. The dominant building for each relevant stack will vary as a function of wind direction and relative building heights.

Figure 8.3 Example of building downwash for Selected Emission Point A2-2



8.4.2.2.5 Concentration Contours

Modelled predicted ambient ground level concentrations beyond the site boundary are presented as concentration contours in Section 8.7.1.2. The purpose of the concentration contour plots is to show the direction and extent of the emission plume.

The air dispersion model (AERMOD) produces numerical output files which contain predicted pollutant concentrations at a large number of discrete receptor points across the modelling domain (defined by the gridded receptors discussed in Section 8.5.3.2.1). These results are typically exported in tabular format, listing the predicted value (e.g. annual mean of pollutant in µg/m³) for each receptor location defined by its X and Y coordinates.

To aid interpretation, these tabular results can be imported into contouring software (e.g. Breeze 3D Analyst, Surfer, ArcGIS or QGIS) where an interpolation algorithm is applied. The software estimates values between the discrete receptor points, allowing for the creation of concentration contours. These are graphical representations that join locations of equal concentration with smooth lines, giving a clear picture of concentration gradients and the spatial extent of impact.

The primary differences between concentration contours and tabular results are:

- Tabular results provide the exact model predictions at defined receptor points and identify the receptor where the maximum model concentration is predicted. These are the values to be relied upon for compliance assessment and reporting against air quality standards or guidelines.

- Contours provide a visual interpretation of how pollutant concentrations vary across the site and surrounding area. They are useful for communicating results, identifying zones of higher or lower impact, and for inclusion in planning documents. However, since contours involve interpolation between points over a large study area (defined by the gridded receptors discussed in Section 8.5.3.2.1, they are approximate representations and should not be used in place of the tabulated receptor results for regulatory comparison. The maximum model concentration presented by concentration contours will always be less than the maximum concentration predicted at an individual receptor, due to the interpolation process of concentrations over a larger area.

Concentration contours have also been produced for the modelled ecology results for the proposed operations scenario. These are presented in Section 8.7.1.3. Specifically, the contours show the extent of the area, as a concentration contour, within which NO_X and nitrogen deposition levels from the facility are greater than 1% of the relevant critical level and lowest critical loads.

Again, concentration contours will always be less than the maximum concentration predicted at an individual receptor, due to the interpolation process of concentrations over a larger area. It is therefore expected that maximum concentrations reported at individual receptors may occur outside contour areas, which would indicate that the area of this maximum concentration is highly localised.

8.4.2.2.6 Methodology for Modelling of Emergency Operations

Regarding emergency operations, USEPA Guidance suggests an average hourly emission rate should be used rather than the maximum hourly rate (USEPA, 2011). As a result, the maximum hourly emission rate from each individual turbine in liquid fuel mode was reduced by *500 no. hours / 8760 annual hours* and the emissions were modelled over a period of one full year.

A second methodology has been published by the UK Environment Agency. The relevant guidance documents are entitled *Diesel Generator Short-Term NO_2 Impact Assessment* (UKEA, 2016) and *Emissions from specified generators - Guidance on dispersion modelling for oxides of nitrogen assessment from specified generators* (UKEA, 2019). The methodology is based on considering the statistical likelihood of an exceedance of the NO_2 hourly limit value (18 exceedances are allowable per year before the air standard

is deemed to have been exceeded, as per S.I. 739 of 2022 and 2008/50/EC). The assessment assumes a hypergeometric distribution to assess the likelihood of exceedance hours coinciding with the emergency operational hours of the turbines. The cumulative hypergeometric distribution of 19 and more hours per year is computed and the probability of an exceedance determined. The guidance suggests that the 98th percentile confidence level should be used to indicate if an exceedance is likely. The guidance suggests that the assessment should be conducted at the nearest residential receptor or at locations where people are likely to be exposed, and it advises that there should be no running time restrictions on turbines in liquid fuel mode when providing power on site during an emergency.

Both the methodology advised in the USEPA guidance as well as the approach described in the UKEA guidance have been applied for the scenarios modelled in this study to ensure a robust assessment of predicted air quality impacts from the proposed development. Applying both methodologies is in line with the guidance outlined in Appendix K of the EPA AG4 guidance (EPA, 2020).

8.4.2.2.7 Process Emissions

Proposed Operations

Once fully operational, the proposed development will have 3 no. turbines (A2-1 – A2-3), which will have the potential to operate continuously in gas mode. Of these turbines 1 no. is permitted and currently regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01. The proposed development will have 2 no. additional turbines, which are identical to the permitted turbine. This modelling assessment has been undertaken at the existing and proposed licensed conditions for the turbines as main emission points.

The turbines will also require quarterly testing/maintenance and may also operate in an emergency in liquid fuel mode (likely fuelled by HVO but assumed diesel for conservative modelling purposes) for no more than 500 hours per turbine, per year.

The 3 no. turbines are also capable of operating on liquid fuel for emergency operation. The turbines are not intended for continuous emergency operation and will not operate on liquid fuel (excluding periods of testing and maintenance) for more than 500 hours per turbine, per year. Their role on liquid fuel is to provide emergency backup power in the event of a disruption to the natural gas supply.

The model input information for this scenario is detailed in Table 8.8, Table 8.9 and Table 8.10.

Table 8.8 Proposed Operations Scenario

Component	Type of Operations	Key Inputs
Turbines (A2-1 to A2-3)	Normal (continuous) operations	The normal continuous operation of the site considers 3 no. turbines operating continuously (24 hours per day, 365 days per year) in gas mode supplied from the national gas grid. Of these 1 no. turbine is permitted and 2 no. additional turbines are proposed.
	Testing	Each turbine is assumed to conservatively operate in liquid fuel mode for 1 hour each week at 100% load, one turbine at a time, for maintenance testing. All testing is assumed to occur between 9am – 5pm Monday to Friday.
	Emergency operations	Potential operation of 3 no. turbines in an emergency due to a disruption to the natural gas supply. 3 no. turbines would operate in liquid fuel mode for a maximum of 500 hours per engine per year. The methodology for modelling these emissions is described in detail in Section 8.4.2.2.6.

Table 8.9. Summary of Process Emission Information for the Installation

Stack Reference	ITM Grid Co-Ordinates (E, N)		Height Above Ground Level (m)	Exit Diameter (m)	Operations	Fuel	Temp (K)	Maximum Volume Flow (Nm^3/hr) [a]	Exit Velocity (m/sec actual)
A2-1	311079	242553	28	7	Continuous	Natural gas	855.95	2,400,000	44.4
					Testing & Emergency	Liquid fuel	837.55	2,475,000	43.3
A2-2	311078	242501	28	7	Continuous	Natural gas	855.95	2,400,000	44.4
					Testing & Emergency	Liquid fuel	837.55	2,475,000	43.3
A2-3	311049	242448	28	7	Continuous	Natural gas	855.95	2,400,000	44.4
					Testing & Emergency	Liquid fuel	837.55	2,475,000	43.3

a. Emissions referenced to 273.15 K, 101.3 Pa, 15% O_2, dry gas

Table 8.10. Summary of Emission Concentrations and Mass Emission Rates for the Installation

Stack Ref.	Operations	Hours of Operations (per year, per plant)	NO_X		CO		SO_X		PM_{10}	
			Conc. (mg/Nm^3)	Mass Emission (g/s)	Conc. (mg/Nm^3)	Mass Emission (g/s)	Conc. (mg/Nm^3)	Mass Emission (g/s)	Conc. (mg/Nm^3)	Mass Emission (g/s)
A2-1 – A2-3 [a]	Normal	8,760	50	33.333	100	66.667	n/a	n/a	n/a	n/a
	Testing	1 hour per week	250	171.875	24	16.5	66	6.875	10	45.375
	Emergency	500	250	9.810	24	0.942	66	0.394	10	2.589

a. Emissions referenced to 273.15 K, 101.3 Pa, 15% O_2, dry gas

Cumulative Assessment

The Cumulative Assessment scenario assessed the combined impact of the emissions from the Installation and the following facilities with a relevant IE licence application, IE final determination or granted planning permission (shown in Figure 8.6), with the associated process emissions outlined in Table 8.11:

- Installation emissions as outlined in the Proposed Operation scenario above;
- Nearby IE licenced main emission points;
- Scheduled testing emissions associated with energy centres and emergency generators in the neighbouring proposed and operational data storage facilities obtained from relevant granted planning permission applications and IE licences.

Emission points from pharmaceutical sites, power stations, and onsite electricity generation emit typically air pollutants on a continuous basis over the course of a year. In contrast, nearby data storage facilities (with IE licence or planning permission only) have emergency generators, that will only operate under exceptional circumstances and thus will not be in operation on a day-to-day basis. In line with the methodology of AG4 (EPA, 2020), the emergency-only operations emission points associated with other nearby data storage facilities should not be included in a reasonable worst-case cumulative assessment, as doing so would not reflect normal or expected operational conditions.

However, in the interest of robustness, a conservative cumulative scenario has been modelled which incorporates the permitted emergency operating hours of emergency generators associated data centres in the surrounding area. This approach assumes all emergency generators operate concurrently and continuously over the full assumed duration in their planning permissions or IE Licence (as per the USEPA methodology). This assumption is deliberately exaggerated, unrealistic, and represents an overly precautionary scenario. In practice, the simultaneous emergency operation of all nearby standby generators is extremely improbable, both in terms of timing and duration. Environmental Impact Assessment guidance requires that assessments be based on what is *reasonably foreseeable*, not on hypothetical or implausible extremes. Including such highly conservative scenarios risks misrepresenting the likely environmental impact and may lead to disproportionate conclusions that do not align with the actual risk posed.

As such, while this modelling scenario has been included to demonstrate an upper-bound impact, it should be clearly understood as an unrealistic worst-case, rather than a reflection of expected environmental conditions.

Table 8.11. Process Emission Details for Cumulative Assessment

Installation	Emission Source	Height Above Ground Level (m)	Exit Diameter (m)	Type of Operations	Hours of Operation per year, per plant	Fuel	Temp (K)	Exit Velocity (m/sec actual)	NO_2 Mass Emission (g/s)	SO_2 Mass Emission (g/s)	PM_{10} Mass Emission (g/s)
Huntstown IE Reg. No. P0483-04	E1	34.5	7	Continuous	8,760	Natural gas	380.15	18.9	31.250	-	-
				Emergency	500	Liquid fuel			-	2.197	0.33
	E2	34.5	7	Continuous	8,760	Natural gas	383.15	18.9	31.250	-	-
Energia IE Reg. No. P0777-02	E3	34.5	7	Continuous	8,760	Natural gas	380.15	20.5	38.889	-	-
				Emergency	500	Liquid fuel			-	2.511	0.381
Huntstown IE Reg. No. P1194-01	A2-1 – A2-38	25	0.4	Continuous	1,460	Natural gas	682.15	33.6	0.071	-	-
Huntstown Bioenergy IE Reg. No. P0993-02	A2-1	28	0.7	Continuous	8,760	Natural gas	423	16.36	0.220	0.099	-
	A2-2	28	0.7	Continuous	8,760	Natural gas	423	16.36	0.220	0.099	-
Huntstown Data Centre FW21A/0151	56 no. generators	31	0.6	Testing	1 hr per week	Liquid fuel	661.75	9.3	1.4	-	-
				Emergency	100	Liquid fuel	706.05	35.4	0.047	-	-

8.4.2.3 Ecology - Nitrogen and Acid Deposition Methodology

In order to consider the effects of nitrogen deposition and acid deposition owing to emissions from the facility on the designated habitat sites, the maximum annual mean NO_2 and SO_2 predicted environmental concentrations must be converted firstly into a dry deposition flux using the equation below which is taken from UK Environment Agency publication *AGTAG06 – Technical Guidance On Detailed Modelling Approach For An Appropriate Assessment For Emissions To Air* (UKEA, 2014):

Dry deposition flux (µg/m²/s) = ground-level concentration (µg/m³) x deposition velocity (m/s)

The deposition velocities for NO_2 are outlined in AQTAG06 (UKEA, 2014) and shown below in Table 8.12. The dry deposition flux is then multiplied by conversion factors shown in Table 8.12 (taken from AQTAG06 (UKEA, 2014)) to convert it to a nitrogen (N) and sulphur (S) deposition flux (kg/ha/yr), and to an acid deposition flux (keq/ha/yr).

Background concentrations for NO_X, nitrogen deposition and acid deposition at the worst-case designated habitat were derived from the 1 km grid square concentrations provided on the Air Pollution Information System (APIS) website (APIS, 2025), in line with UKEA (UKEA, 2014) and UK DEFRA (UK DEFRA, 2022) guidance, and are given in Section 8.5.2.6. The background concentrations are added directly to the modelled NO_2, SO_2, nitrogen and acid deposition process contributions to give a total predicted environmental concentration.

Table 8.12. Dry Deposition Fluxes for NO_2 and SO_2

Chemical Species	Habitat Type	Recommended Deposition Velocity (m/s)	Nitrogen Deposition Conversion factor µg/m²/s to kg/ha/yr	Acid Deposition Conversion factor µg/m²/s to keq/ha/yr
NO_2	Grassland	0.0015	95.9	6.84
SO_2	Grassland	0.012	157.7	9.84

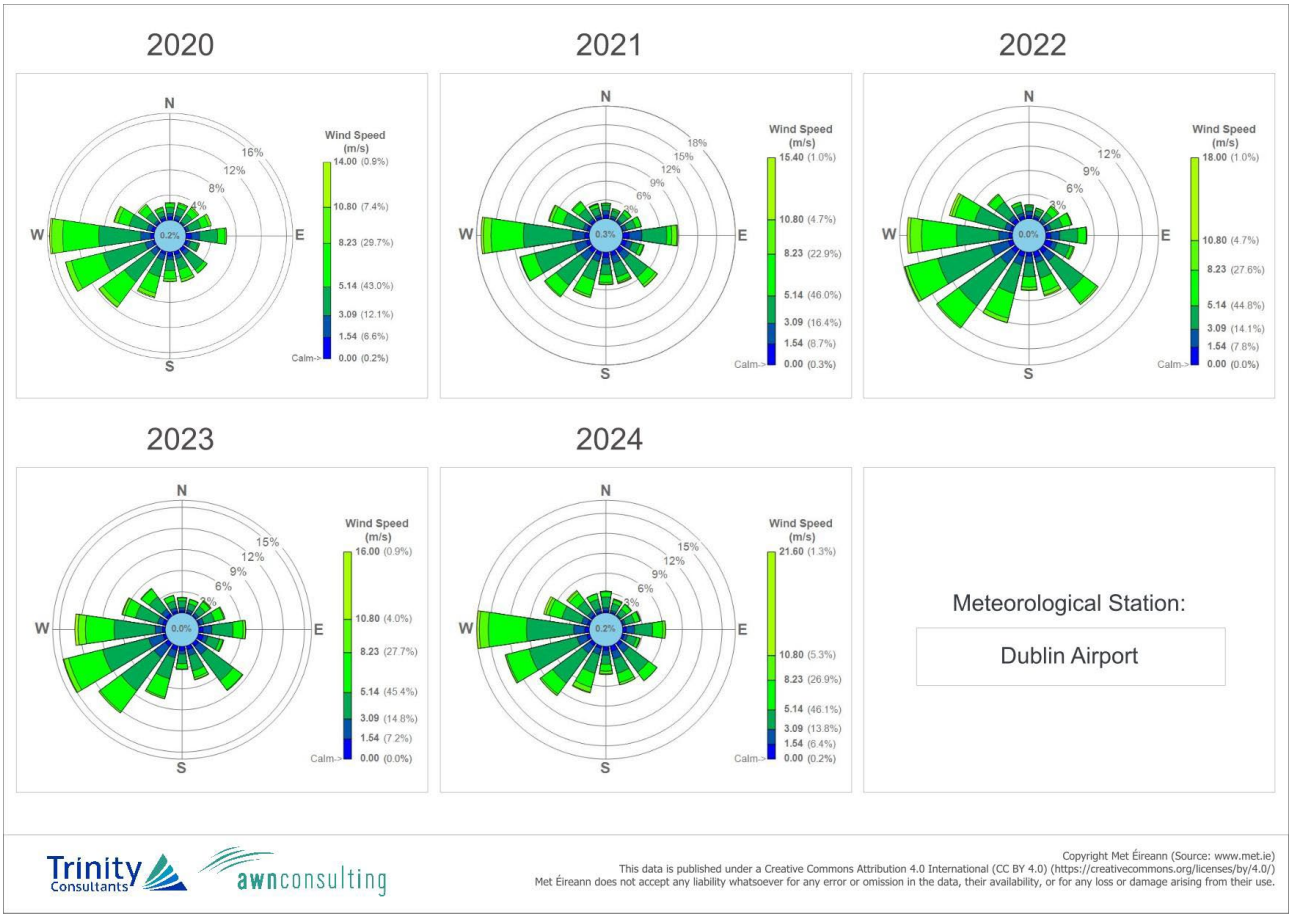
8.5 Receiving Environment

8.5.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 6 km east of the site. Dublin Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 8.4). For data collated during five representative years (2020 – 2024), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.3 m/s over the 30-year period of 1991 – 2020 (Met Éireann, 2025).

Figure 8.4 Wind Roses for Dublin Airport Meteorological Station



8.5.2 Baseline Air Quality

A background concentration is added to the modelled process contribution to account for emission sources not included in the dispersion model.

The background concentrations representative of the area of the proposed development location have been derived from ambient air quality monitoring undertaken in recent years by the EPA and Local Authorities (EPA, 2025a). The most recent annual report on air quality "*Air Quality in Ireland 2024*" (EPA, 2025a) 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), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2025a). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 25 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, the area of the proposed development is categorised as Zone A (EPA, 2025a).

Continuous monitoring by the EPA is carried out at a number of monitoring stations within Zone A; these include urban background sites, roadside (traffic) sites and suburban background sites.

It is necessary to select monitoring stations that are representative of the site location. Not all monitoring stations are considered suitable for determining background pollutant concentrations and must be reviewed on a case-by-case basis to determine the most appropriate EPA monitoring sites for the assessment.

The EPA, on their website (EPA, 2025b), state that background sites generally represent overall area-wide exposure more closely than roadside sites. Roadside monitoring sites are heavily influenced by traffic emissions and are not considered representative of area-wide pollutant levels. The purpose of this assessment, and particularly the cumulative assessment, is to determine the predicted pollutant concentrations over a wide area, roadside monitoring stations data is not considered appropriate.

The full suite of EPA Zone A suburban background monitoring stations was therefore reviewed to determine those that were most appropriate to estimate background pollutant levels for the area of the proposed development.

The selected monitoring sites are suburban background monitoring locations which are not heavily influenced by traffic or other major air emission sources and can provide an indicative estimate of the background NO_2 concentrations in the vicinity of the subject proposed development. Road traffic is a significant contributor to NO_2 concentrations with concentrations of the pollutant decreasing rapidly with increasing distance from the road source. As mentioned by the EPA on their website (EPA, 2025b), background sites generally represent overall area-wide exposure more closely than roadside sites. The selected representative Zone A monitoring locations are also not influenced by site specific NO_2 emissions such as those from Dublin Airport. While the monitoring station at Dublin Airport is categorised as a suburban background station, it is not considered representative of the site location as it is heavily impacted by emissions from aircraft.

Selection of a reasonably representative background concentration is important to producing a reasonably conservative predicted environmental concentration (PEC). Utilising a maximum monitored background concentration for the purposes of representing an absolute worst-case PEC is considered overly conservative. For the purposes of this assessment, the 5-year average concentration at the selected EPA monitoring stations has been reviewed in order to determine a suitable background pollutant concentration for this assessment.

8.5.2.1 NO_2

With regard to NO_2, continuous monitoring data from the EPA (EPA, 2025a) is carried out at a number of monitoring stations within Zone A. The Zone A monitoring stations of Ballyfermot, Dún Laoghaire, Swords and Tallaght were considered representative of the site location.

Table 8.13 shows that current NO_2 concentrations at the selected Zone A monitoring locations are below both the annual and 1-hour limit values, with annual average levels ranging from 10 – 12 µg/m^3 in 2024. The 5-year average data for the selected sites for the period 2020 – 2024 was used to estimate the current background NO_2 concentration in the region of the proposed development. Over the period 2020 – 2024 was used to estimate the current background NO_2 concentration in the region of the proposed development. annual mean NO_2 concentrations at the selected sites ranged from 10 – 16 µg/m^3 with an overall 5-year average across the four sites of 13 µg/m^3.

Additionally, long term trends in ambient NO_2 concentrations indicate either reductions or relatively stable levels over time, with significant increases unlikely in the future. *Ireland's Air Pollutant Emissions 2022 (1990-2030)* report also demonstrates that Ireland's emissions of NO_X have been generally decreasing since 1990, with a reduction of 53.8% over the period 2005-2021 observed (EPA, 2024b).

Based on the discussed recent monitoring data and long-term pollutant trends a background NO_2 concentration of **13 µg/m^3** is considered a reasonably conservative estimate and representative of the region of the proposed development for the purposes of this assessment.

For the modelling assessment methodology as described in Section 8.4.2.2, the modelled process concentration is added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site. NO_2 has ambient air quality standards for both annual mean

and hourly concentrations that must be complied with (see Table 8.1). In relation to the annual average background, the ambient background concentration is added directly to the process concentration with the short-term (hourly) peaks assumed to have an ambient background concentration of twice the annual mean background concentration.

Table 8.13. Background NO_2 Concentrations (µg/m³)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Ballyfermot	Annual Mean NO_2 (µg/m³)	12	13	13	13	12
	1-hr Mean NO_2 values >200 µg/m³	0	0	0	0	0
Dun Laoghaire	Annual Mean NO_2 (µg/m³)	13	16	16	13	11
	1-hr Mean NO_2 values >200 µg/m³	0	0	0	0	0
Swords	Annual Mean NO_2 (µg/m³)	11	11	12	10	10
	1-hr Mean NO_2 values >200 µg/m³	0	0	0	0	0
Tallaght	Annual Mean NO_2 (µg/m³)	14	13	14	14	12
	1-hr Mean NO_2 values >200 µg/m³	0	0	0	0	0
Annual Mean NO_2 (µg/m³)	Limit Value (to be attained by 2026 and applicable until 2030)	40				
1 hr Mean NO_2 (as 99.8th%ile) (µg/m³)	Limit Value (to be attained by 2026 and applicable until 2030)	200				
1-hr Mean NO_2 values >200 µg/m³		No more than 18 exceedances				

8.5.2.2 CO

In terms of CO, monitoring has been conducted at the suburban background Zone A site of Dublin Airport over the period 2020 – 2024 (Table 8.14). There are no other suitably representative CO monitoring stations within Zone A.

Monitored concentrations are significantly below the ambient limit value of 10 mg/m³. Maximum 8-hour concentrations at the Dublin Airport site ranged from 0.7 mg/m³ – 3.7 mg/m³ over the period 2020 – 2024 (EPA, 2025a). The 5-year average maximum 8-hour CO concentration is 1.4 mg/m³.

Based on these results a background 8-hour CO concentration of **3.7 mg/m³** has been used in the modelling assessment. This estimated background concentration has been added directly to the modelled 8-hour maximum result to produce the predicted environmental concentration in terms of CO.

Table 8.14. Background CO Concentrations (µg/m³)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
DAA	Max 8-hr Mean CO (mg/m³)	3.7	1.3	0.7	0.7	0.7
Max. 8-hr Mean CO (mg/m³)	Limit Value (to be attained by 2026 and applicable until 2030)	10				

8.5.2.3 PM_{10}

The Zone A suburban background locations of Ballyfermot, Dún Laoghaire, Finglas, Marino, Phoenix Park, St. Anne's Park and Tallaght are considered representative of the site location.

Continuous PM_{10} monitoring carried out in 2024 showed annual mean concentrations ranging from 9 – 12 µg/m^3 (For the modelling assessment methodology as described in Section 8.4.2.2, the modelled process contributions is added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site. In relation to the short-term (hourly and daily) backgrounds, twice the annual mean background concentration is added directly to the short-term process contributions.

Table 8.15). The 5-year average data for these sites for the period 2020 – 2024 was used to estimate the current annual mean background PM_{10} concentration in the region of the proposed development. Over the period 2020 – 2024 annual mean PM_{10} concentrations at the selected sites ranged from 9 – 14 µg/m^3 with an overall 5-year average across the sites of 12 µg/m^3.

Based on these results, a reasonably conservative estimate of the annual mean background PM_{10} concentration in the region of the proposed development is **12 µg/m^3**.

For the modelling assessment methodology as described in Section 8.4.2.2, the modelled process contributions is added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site. In relation to the short-term (hourly and daily) backgrounds, twice the annual mean background concentration is added directly to the short-term process contributions.

Table 8.15. Background PM_{10} Concentrations (µg/m^3)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	12	12	13	11	11
	24-hr Mean > 50 µg/m^3 (days)	2	0	1	0	0
Dun Laoghaire	Annual Mean PM_{10} (µg/m^3)	12	11	12	12	12
	24-hr Mean > 50 µg/m^3 (days)	0	0	1	0	1
Finglas	Annual Mean PM_{10} (µg/m^3)	12	12	12	12	12
	24-hr Mean > 50 µg/m^3 (days)	0	0	1	0	0
Marino	Annual Mean PM_{10} (µg/m^3)	13	12	14	12	12
	24-hr Mean > 50 µg/m^3 (days)	0	0	3	0	0
Phoenix Park	Annual Mean PM_{10} (µg/m^3)	10	10	11	9	10
	24-hr Mean > 50 µg/m^3 (days)	0	0	0	0	0
St. Anne's Park	Annual Mean PM_{10} (µg/m^3)	11	11	13	11	11
	24-hr Mean > 50 µg/m^3 (days)	0	0	1	0	0
Tallaght	Annual Mean PM_{10} (µg/m^3)	10	10	11	11	10
	24-hr Mean > 50 µg/m^3 (days)	1	0	1	1	0
Annual Mean PM_{10} (µg/m^3)	Limit Value (to be attained by 2026 and applicable until 2030)	40				
24 hr Mean PM_{10} (as 90.4th%ile) (µg/m^3)		50				

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
24-hr Mean PM_{10} values > 50 µg/m^3		No more than 35 exceedances				

8.5.2.4 $PM_{2.5}$

The Zone A suburban background locations of Ballyfermot, Dún Laoghaire, Finglas, Marino, Phoenix Park, and St. Anne's Park are considered representative of the site location. Continuous $PM_{2.5}$ monitoring carried out in 2024 showed annual mean concentrations ranging from 6 – 8 µg/m^3 (see Table 8.16). The 5-year average data for these sites for the period 2020 – 2024 was used to estimate the current annual mean background $PM_{2.5}$ concentration in the region of the proposed development. Over the period 2020 – 2024 annual mean $PM_{2.5}$ concentrations at the selected sites ranged from 6 – 9 µg/m^3 with an overall 5-year average across the sites of 7 µg/m^3.

Based on these results, a reasonably conservative estimate of the annual mean background $PM_{2.5}$ concentration in the region of the proposed development is **8 µg/m^3**.

This ambient annual mean background concentration is added directly to the modelled annual mean process concentration to produce the predicted environmental concentration in terms of $PM_{2.5}$.

Table 8.16. Background $PM_{2.5}$ Concentrations (µg/m^3)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Ballyfermot	Annual Mean $PM_{2.5}$ (µg/m^3)	8	8	8	7	7
Dun Laoghaire	Annual Mean $PM_{2.5}$ (µg/m^3)	8	8	8	7	7
Finglas	Annual Mean $PM_{2.5}$ (µg/m^3)	7	8	7	7	7
Marino	Annual Mean $PM_{2.5}$ (µg/m^3)	8	8	9	7	8
Phoenix Park	Annual Mean $PM_{2.5}$ (µg/m^3)	7	6	6	6	7
St. Anne's Park	Annual Mean $PM_{2.5}$ (µg/m^3)	7	7	8	7	6
Annual Mean $PM_{2.5}$ (µg/m^3)	Limit Value (to be attained by 2026 and applicable until 2030)	25				

8.5.2.5 SO_2

The Zone A monitoring station at Rathmines is considered representative of the site location. The only Zone A background station that monitors SO_2 is DAA, which, as previously established, is not considered representative of the proposed development due to its proximity to airport emissions. Data from the monitoring station in Rathmines is considered appropriate for the purposes of this assessment.

Continuous SO_2 monitoring carried out in 2024 showed an annual mean concentration of 4 µg/m^3 (see For the modelling assessment methodology as described in Section 8.4.2.2, the modelled process contributions is added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site. In relation to the short-term (hourly and daily) backgrounds, twice the annual mean background concentration is added directly to the short-term process contributions.

Table 8.17). The 5-year average data for this site for the period 2020 – 2024 was used to estimate the current annual mean background SO_2 concentration in the region of the proposed development. Over the

period 2020 – 2024 annual mean SO_2 concentrations at the selected site ranged from 1 – 4 µg/m^3 with an overall 5-year average of 2 µg/m^3.

Based on these results, a reasonably conservative estimate of the annual mean background SO_2 concentration in the region of the proposed development is **2 µg/m^3**.

For the modelling assessment methodology as described in Section 8.4.2.2, the modelled process contributions is added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site. In relation to the short-term (hourly and daily) backgrounds, twice the annual mean background concentration is added directly to the short-term process contributions.

Table 8.17. Background SO_2 Concentrations (µg/m^3)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Rathmines	Annual Mean SO_2 (µg/m^3)	1	1	2	2	4
	1-hr Mean SO_2 values >350 µg/m^3	0	-	0	0	-
	24-hr Mean SO_2 values > 125 µg/m^3	0	0	0	0	-
Annual Mean SO_2 (µg/m^3)	Limit Value (to be attained by 2026 and applicable until 2030)	n/a				
1 hr Mean SO_2 (as 99.7th%ile) (µg/m^3)	Limit Value (to be attained by 2026 and applicable until 2030)	350				
1-hr Mean SO_2 values >350 µg/m^3		No more than 24 exceedances				
24 hr Mean SO_2 (as 99.2nd%ile) (µg/m^3)	Limit Value (to be attained by 2026 and applicable until 2030)	125				
24-hr Mean SO_2 values > 125 µg/m^3		No more than 3 exceedances				

8.5.2.6 Ecology

Background concentrations for NO_X , nitrogen and acid deposition modelled ecology receptors were derived from the 1 km grid square concentrations provided on the Air Pollution Information System (APIS) website (APIS, 2025), in line with UKEA (UKEA, 2014) and UK DEFRA (UK DEFRA, 2022) guidance, and are shown in Table 8.18. The background concentrations are added directly to the modelled process contributions to give a total predicted environmental concentration.

Where a designated site covers a large area, such as a river system, APIS background concentrations were used at the locations of receptors where the modelling results predicted the maximum process contributions. For smaller sites, the maximum background concentration predicted by APIS was used to calculate PEC.

Table 8.18. Background Concentrations for NO_X, SO_2, Nitrogen and Acid Deposition

Ecology Receptor	APIS Background Type	NO_X ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	Nitrogen Deposition (kg/ha/yr)	Acid Deposition (keq/ha/yr)
Malahide Estuary SAC	Based on maximum PEC receptor location	12.8	0.9	5.6	0.4
Malahide Estuary SPA	Based on maximum PEC receptor location	12.8	0.9	5.6	0.5
South Dublin Bay and River Tolka Estuary SPA	Based on maximum PEC receptor location	18.9	2.8	6.3	0.4

8.5.3 Sensitivity of the Receiving Environment

8.5.3.1 Construction Phase

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) 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 (ZoI previously defined in Section 8.4.1) are taken into consideration.

The type of receptors and their sensitivity to dust soiling, human health effects of PM_{10} and ecological effects are defined in the IAQM guidance (IAQM, 2024). High sensitivity receptors are regarded as residential properties, hospitals, schools and residential care homes where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods (such as public footpaths or parks) or do not expect a high level of amenity. Table 8.19 outlines the criteria for determining the sensitivity of the area to dust soiling and dust-related human health effects as per the IAQM guidance (IAQM, 2024).

Table 8.19 Criteria for Determining the Sensitivity of the Area Update

Sensitivity of the Area to Dust Soiling Effects on People and Property					
Receptor Sensitivity	**Number of Receptors**	**Distance from Source (m)**			
		<20	**<50**	**<100**	**<250**
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
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**	**<250**

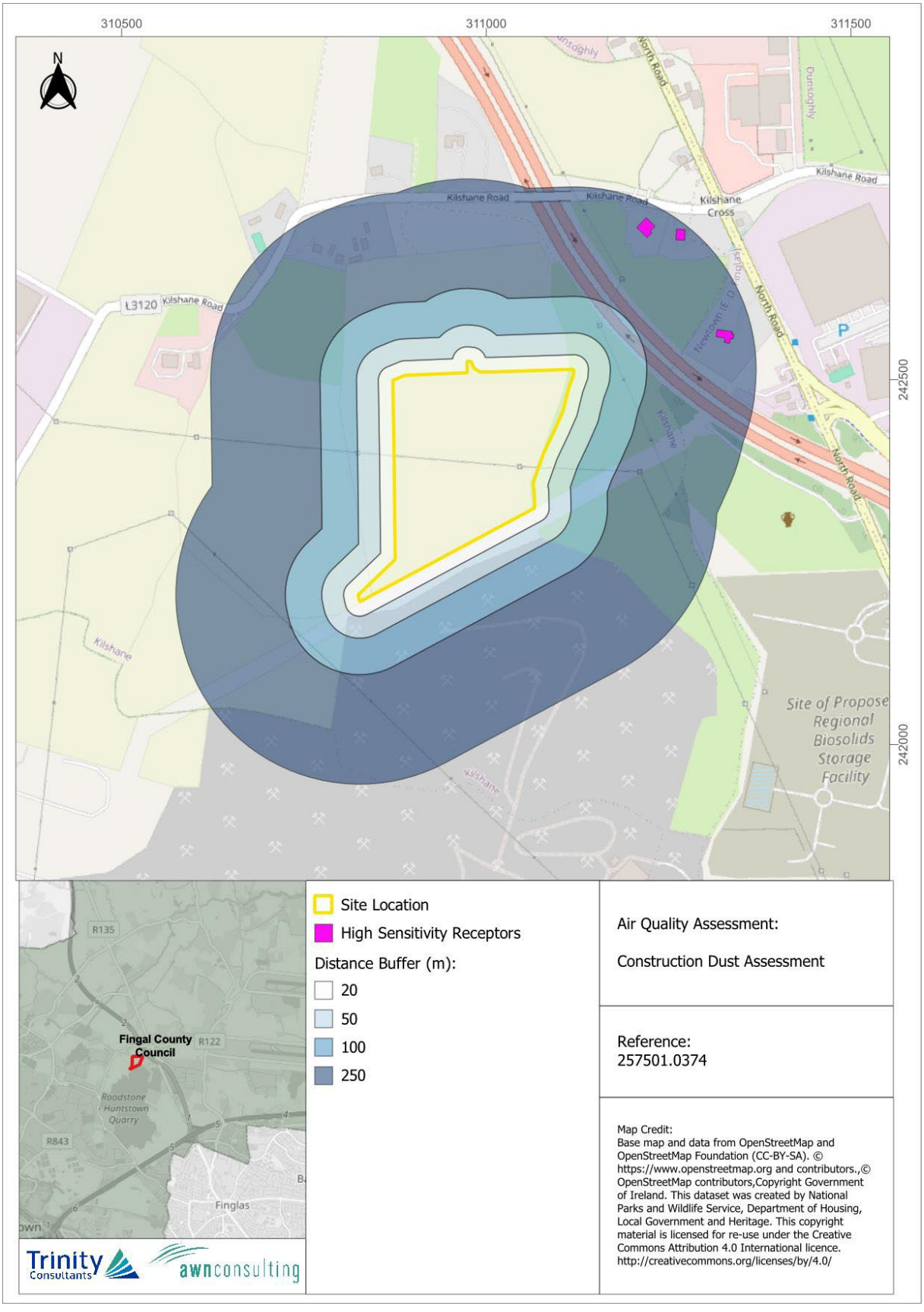
Sensitivity of the Area to Dust Soiling Effects on People and Property						
Receptor Sensitivity	**Number of Receptors**		**Distance from Source (m)**			
			<20	**<50**	**<100**	**<250**
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	**Low**
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

In terms of receptor sensitivity to dust soiling, the area directly surrounding the proposed development (within 250 m of the boundary) is predominantly sub-urban in nature. There are between 1-10 high sensitivity residential properties within 250 m of the construction site boundary (see Figure 8.5). Based on these receptor numbers and using the IAQM criteria in Table 8.19, the sensitivity of the area to dust soiling impacts from the proposed development is 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 PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 12 µg/m^3. There are between 1-10 high sensitivity residential properties within 250 m of the construction site boundary (see Figure 8.5). Based on the IAQM criteria outlined in Table 8.19 the worst-case sensitivity of the area to dust-related human health effects is 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 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. There are no sensitive ecological receptors that meet these criteria within the study area and there is no potential for impacts to sensitive ecology from construction dust emissions and no further assessment is required.

Figure 8.5 Construction Dust Assessment – Sensitive Receptors within 250 m of Site



8.5.3.2 Operational Phase

The dispersion modelling has incorporated a variety of receptors, including a gridded receptor network, site boundary receptors, and individual discrete receptors representing specific residential properties or sensitive ecological sites. Ecological sites were modelled 0 m above ground, while all other receptors were modelled at 1.5 m to represent breathing height.

8.5.3.2.1 Human Receptors

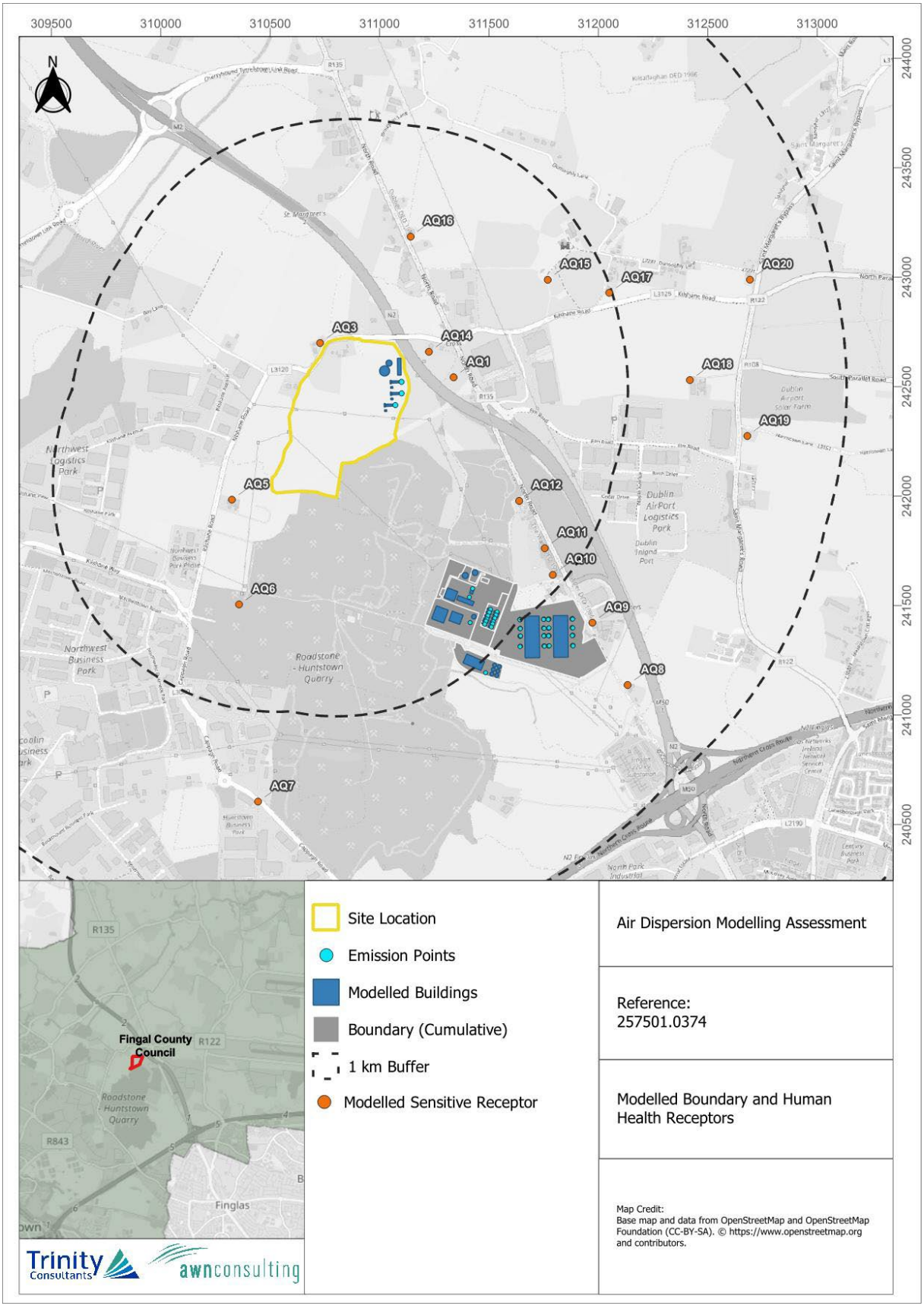
The Zone of Influence (ZoI) for the human health effects of the operational phase emissions of the proposed development was modelled as follows, and determined in line with AG4 guidance (EPA, 2020).

Three receptor grids were created at which concentrations would be modelled. Receptors were mapped with sufficient resolution to ensure all localised "hot-spots" were identified without adding unduly to processing time. The receptor grids were based on a Cartesian grid with the site at the centre. An outer grid measured 10 x 10 km with the site at the centre and with concentrations calculated at 200 m intervals. A medium density grid measured 3 x 3 km with the site at the centre and with concentrations calculated at 50 m intervals. A smaller, denser grid measured 1 x 1 km with concentrations calculated at 25 m intervals.

Boundary receptor locations were also placed along the ownership boundary of the site at 25 m intervals giving a total of 4,072 calculation points for the model.

The impact of the emission sources was also measured at nearby residential receptors (AQ) (identified via a combination of satellite imagery and Eircode search) which were added to the model as discrete receptors (shown in Figure 8.6; 1 km buffer for scale purposes, ZoI as per above).

Figure 8.6 Modelled boundary and human health receptors.



8.5.3.2.2 Ecology Receptors

The impact of emissions of NO_X, nitrogen and acid deposition from the facility on ambient ground level concentrations was assessed using AERMOD within European sites and NHAs (in line with guidance described in Section 8.3.2.3).

An initial geospatial search was conducted (NPWS, 2025) to identify all European sites within screening distances of 10 km of the facility that could potentially be affected by the facility, and the nearest national sites (NHA) within 2 km of the facility that could potentially be affected by the facility, based on the methodology recommended by the UK Environment Agency in their guidance *Air emissions risk assessment for your environmental permit* (UKEA, 2025). This search zone ensures that all European sites with the potential to be impacted via direct, indirect or cumulative pathways from air emissions are appropriately considered. Beyond these distances, the effects on ecology due to emissions from the facility are expected to be not significant.

There are no national sites identified within 2 km of the facility, indicating there is no likely significant effect on national sites. National sites are therefore scoped out of this assessment.

The final study area also considered the extent of the area within which NO_X and nitrogen deposition levels from the facility are greater than 1% of the relevant critical level and lowest critical loads. These areas were determined by concentration contours, the methodology for which is discussed in Section 8.4.2.2.5 and contours themselves are presented in Section 8.7.1.3. Designated sites have been included in this assessment when they are within or in close proximity to these 1% threshold concentration contours.

The concentration contours were generated based on a Cartesian receptor grid of 100 x 100 km, with the site at the centre and with concentrations calculated at 1000 m intervals.

The ecology receptors included in the dispersion model are shown in Table 8.20 and Figure 8.7.

Also shown in Figure 8.7 are the areas where process contributions of NO_X/NO_2 and SO_2 from the facility (derived from worst-case year Proposed Operations modelling results, see Section 8.7.1.3) are greater than the Limit of Detection (LoD) ("*Annual Mean Model Conc. >LoD"* in figure legend) for the relevant monitoring instruments. Limit of detection is defined as the smallest concentration that can be reliably measured by an analytical procedure. The EPA guidelines (EPA, 2022) define an imperceptible effect as *"an effect capable of measurement but without significant consequences".* A NO_X/NO_2 or SO_2 process contribution that is below a monitoring instrument's limit of detection is not measurable and will therefore have a less than imperceptible effect. The areas beyond the LoD contours shown in Figure 8.7 are therefore predicted to experience process contributions below the LoDs and imperceptible effects. The relevant LoDs are:

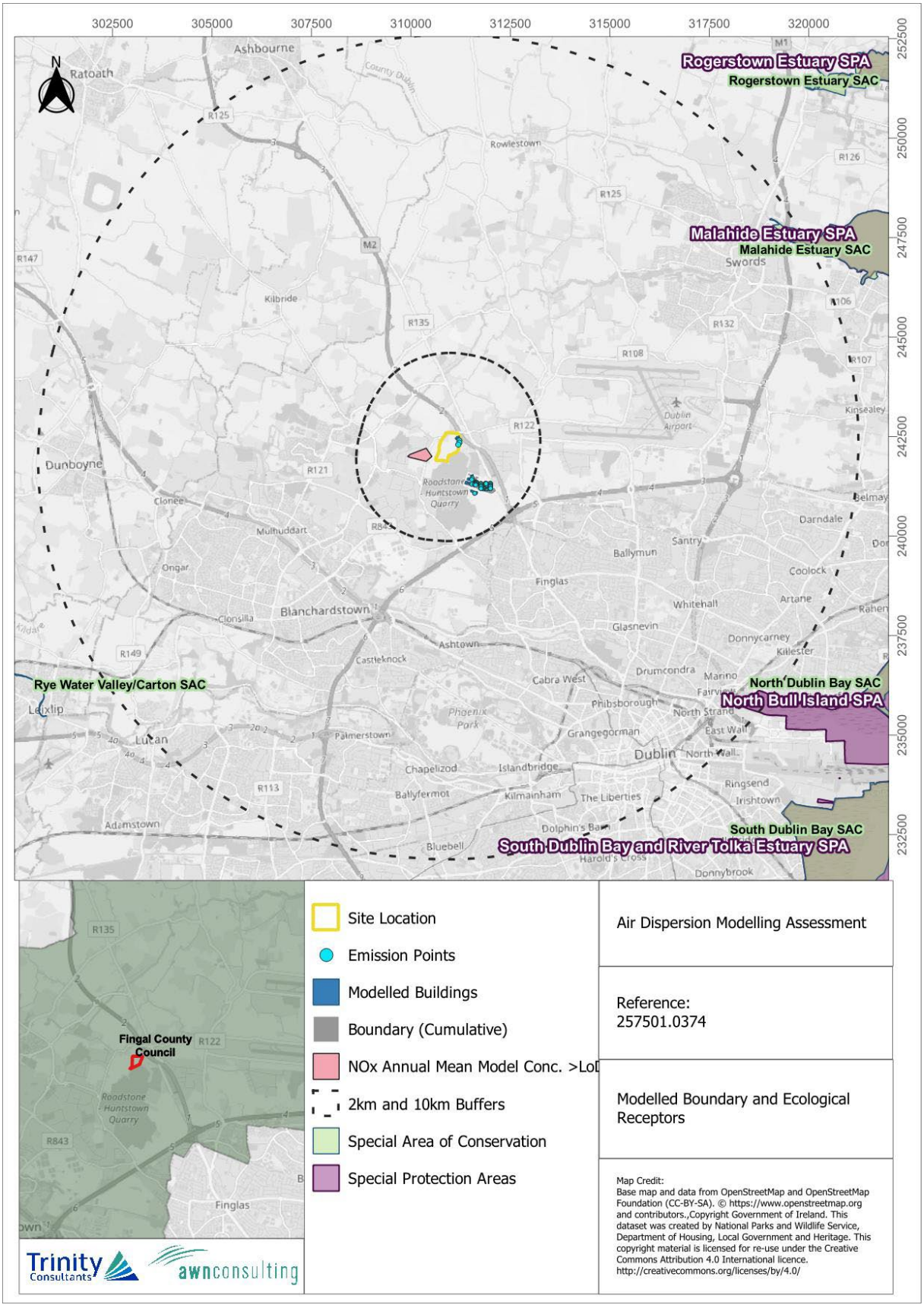
- **NO_X/NO_2** – 0.5 ug/m^3 which must be achieved by chemiluminescence-based automated NO_X/NO_2 analysers (EN 14211)
- **SO_2** – 0.14 ug/m^3 which must be achieved by fluorescence-based automated SO_2 analysers (Thermo Scientific, 2025). Note that the maximum modelled concentration of SO_2 is well below this LoD and therefore a contour cannot be produced (i.e. there is no area where concentrations are above the LoD).

Dispersion modelling of relevant pollutant emissions from all emission points at the facility were predicted at receptors within the ecological sites for all five years of meteorological data modelled. For modelling purposes, worst-case exposure is expected at the boundaries of the sensitive ecosystems. Ecological receptors were modelled 0 m above ground.

Table 8.20. Ecology Receptors Included in Dispersion Model

Special Area of Conservation (SAC)	Special Protection Area (SPA)	Natural Heritage Area (NHA)
Malahide Estuary SAC	Malahide Estuary SPA	No NHAs within 2km.
	South Dublin Bay and River Tolka Estuary SPA	

Figure 8.7 Sensitive Receptors Included in Operational Phase Air Dispersion Modelling Assessment



8.6 The 'Do Nothing' Scenario

In the Do-Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

No construction works will take place, and the identified impacts of fugitive dust and particulate matter emissions will not occur at the subject site.

The 2 no. additional turbines proposed as part of the development will not be installed and the associated emissions will not occur. The permitted 1 no. turbined currently regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01 would operate, and the effect on air quality would occur as assessed by the Air Emissions Impact Assessment carried out as part of the IE licence P1208-01 application process. This Do-Nothing scenario is predicted to have a direct, long-term, negative and not significant effect on air quality.

8.7 Potential Impacts of the Proposed Development

8.7.1 Construction Phase

8.7.1.1 Construction Dust Assessment

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 250 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2024). 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 Cork Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 8.5.1). 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 200 days per year have rainfall over 0.2 mm (Met Éireann, 2025a). Therefore, it can be determined that over 54% of the time dust generation will be

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 (Section 8.5.3). The major dust generating activities are divided into four types within the IAQM (IAQM, 2024) guidance to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (movement of heavy vehicles).

8.7.1.1.1 *Determining the Potential Dust Emission Magnitude*

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity has been determined below for the proposed development using the criteria in Table 8.6.

- Demolition: No demolition required.
- Earthworks: The dust emission magnitude for the proposed earthworks activities can be classified as medium as a worst-case as the total site area is between 18,000 m^2 and 110,000 m^2.
- Construction: The dust emission magnitude for the proposed construction activities can be classified as small as a worst-case as the total volume of buildings and structures with dust generating potential to be constructed will be less than 12,000 m^3.

- Trackout: The dust emission magnitude for the proposed trackout can be classified as medium, as there will be between 20 - 50 outward HGV movements per day during the construction phase of the proposed development.

8.7.1.1.2 *Determining the Risk of Dust Impacts*

Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling and dust-related human health effects (Section 8.5.3). The level of risk associated with each activity is determined using the criteria in Table 8.7. The overall risk of dust impacts from the construction works is shown in Table 8.21 for each category.

There is at most a low risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the proposed works. As a result, best practice dust mitigation measures associated with low risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, the likely effect of the dust impacts within the ZoI are predicted to be ***direct, short-term, negative*** and ***slight***.

Table 8.21 Risk of Dust Impacts used to Define Site-Specific Mitigation

Receptor	Receptor Sensitivity	Dust Emission Magnitude	Risk of Dust-Related Impacts
Demolition			
Dust Soiling	n/a	n/a	n/a
Human Health	n/a		n/a
Earthworks			
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk
Construction			
Dust Soiling	Low	Small	Negligible Risk
Human Health	Low		Negligible Risk
Trackout			
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk

8.7.2 Operational Phase

8.7.2.1 Air Dispersion Modelling Assessment – Human Health

8.7.2.1.1 NO_2 – Proposed Operations

The results indicate that ambient ground level concentrations of NO_2, detailed in Table 8.22, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded, and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient NO_2 concentration (including background) at the worst-case receptor which are at most:

- 35% of the annual limit value,
- 48% of the 1-hour mean (measured as a 99.8th percentile) limit value.

The geographical variations in ground level NO_2 predicted environmental concentrations (PEC) beyond the facility boundary for the worst-case year modelled are illustrated as concentration contours in Figure 8.8 (annual mean) and Figure 8.9 (1-hr mean, as 99.8th%ile), to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for NO_2 are also shown in these figures, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of nitrogen dioxide (NO_2) due to emissions from the Proposed Development on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.22. Proposed Operations – Dispersion Model Results for Nitrogen Dioxide (NO_2)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
NO_2 / 2020	Annual Mean	Boundary	676807, 5922116	0.8	13	13.8	40	34%
	99.8th %ile of 1-hr means	Boundary	676878, 5922136	64.4	26	90.4	200	45%
NO_2 / 2021	Annual Mean	Boundary	676857, 5922366	0.9	13	13.9	40	35%
	99.8th %ile of 1-hr means	Boundary	676942, 5922434	70.5	26	96.5	200	48%
NO_2 / 2022	Annual Mean	Boundary	676657, 5922315	0.5	13	13.5	40	34%
	99.8th %ile of 1-hr means	Grid	676657, 5922116	32.8	26	58.8	200	29%
NO_2 / 2023	Annual Mean	Boundary	676756, 5922315	0.7	13	13.7	40	34%
	99.8th %ile of 1-hr means	Grid	676657, 5922316	45.1	26	71.1	200	36%
NO_2 / 2024	Annual Mean	Boundary	676757, 5922366	0.8	13	13.8	40	34%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	43.4	26	69.4	200	35%

Figure 8.8 Proposed Operations Scenario - Annual Mean NO_2 Concentrations

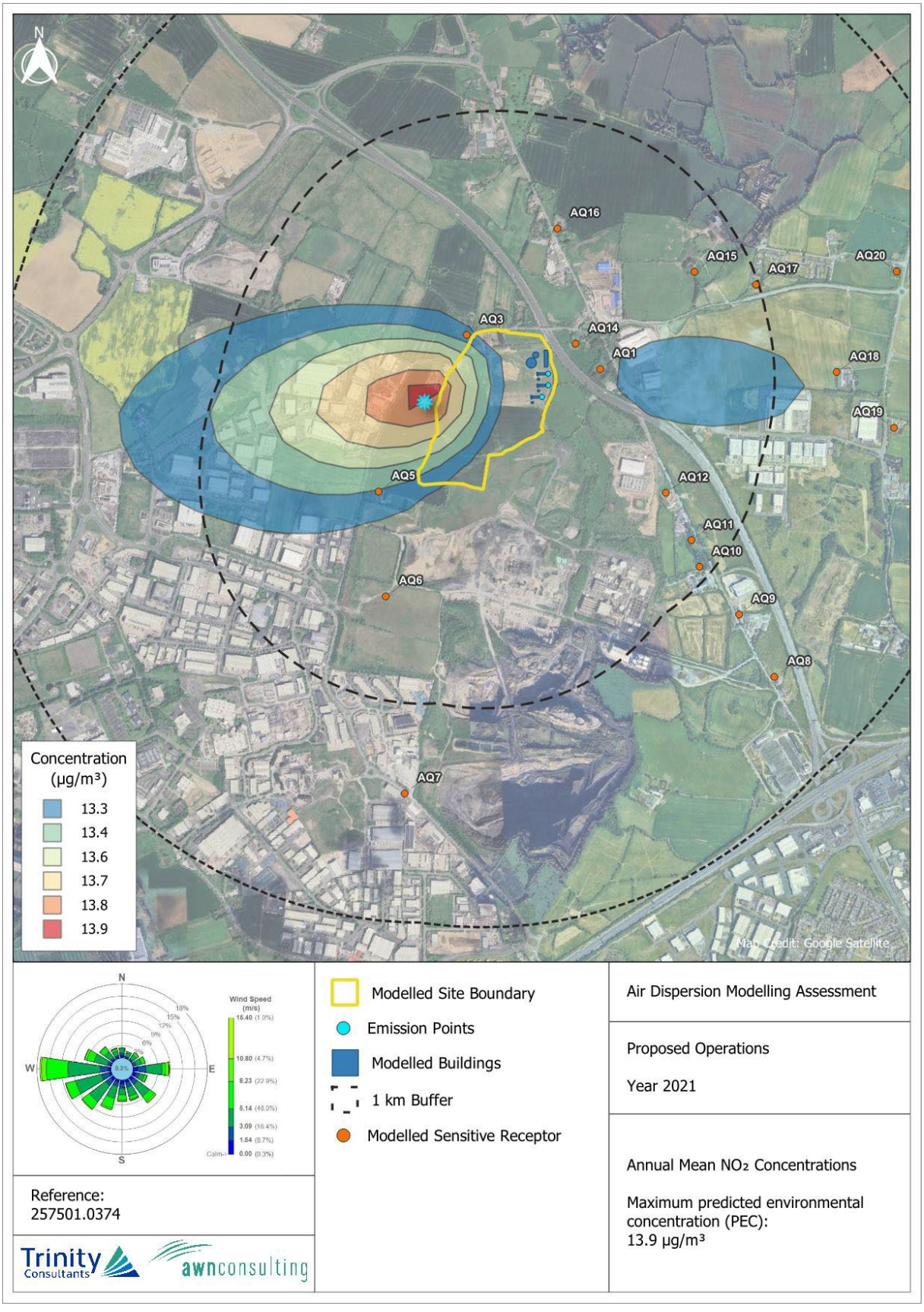
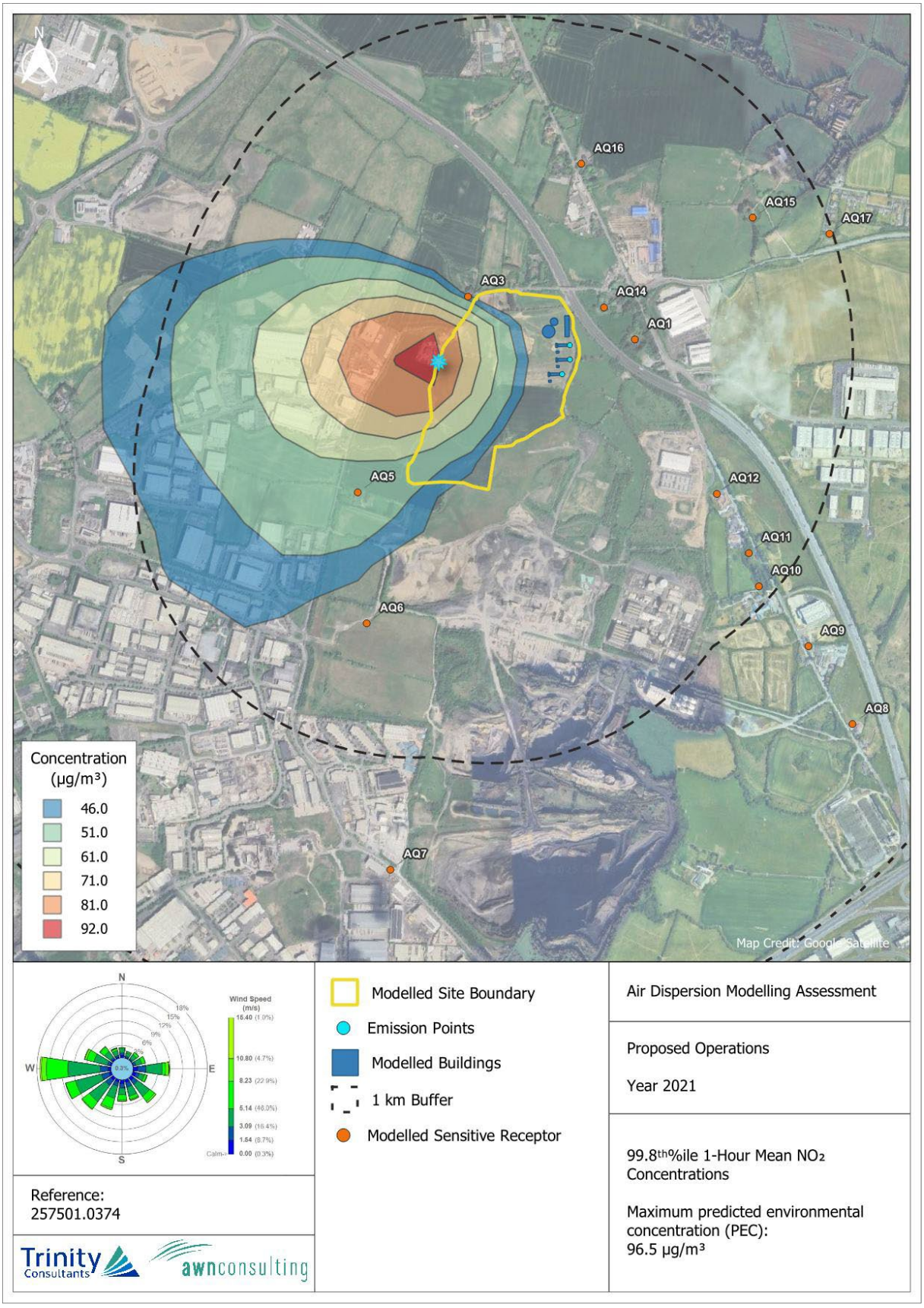


Figure 8.9 Proposed Operations Scenario - Maximum 1-Hour NO_2 Concentrations (as 99.8th%ile)



8.7.2.1.2 CO – Proposed Operations

The results indicate that ambient ground level concentrations of CO, detailed in Table 8.23, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient CO concentration (including background) which is 39% of the maximum ambient 8-hour limit value at the worst-case receptor.

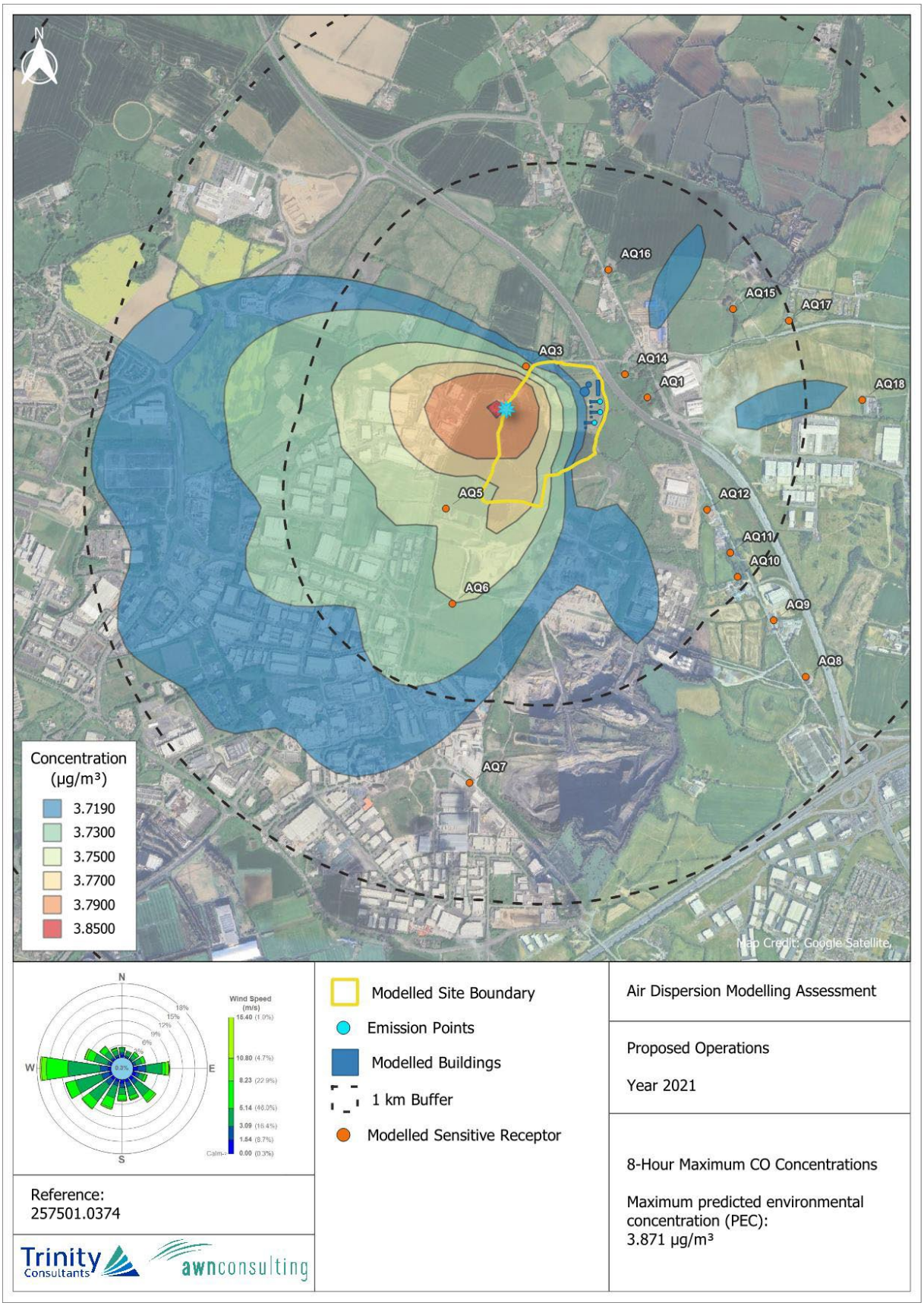
The geographical variations in ground level CO predicted environmental concentrations (PEC) beyond the facility boundary for the worst-case year modelled are illustrated as concentration contours in Figure 8.10, to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for CO are also shown in this figure, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of carbon monoxide (CO) due to emissions from the Proposed Development on sensitive human health receptors is considered to be *direct, long-term, negative* and *not significant*.

Table 8.23. Proposed Operations – Dispersion Model Results for Carbon Monoxide (CO)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
CO / 2020	Maximum Daily 8-Hour Mean	Boundary	677207, 5922066	0.128	3.7	3.828	10	38%
CO / 2021	Maximum Daily 8-Hour Mean	Boundary	676950, 5922457	0.171	3.7	3.871	10	39%
CO / 2022	Maximum Daily 8-Hour Mean	Boundary	676857, 5922316	0.070	3.7	3.770	10	38%
CO / 2023	Maximum Daily 8-Hour Mean	Boundary	677170, 5922125	0.148	3.7	3.848	10	38%
CO / 2024	Maximum Daily 8-Hour Mean	Boundary	676927, 5922407	0.131	3.7	3.831	10	38%

Figure 8.10 Proposed Operations Scenario - Maximum 8-Hour CO Concentrations



8.7.2.1.3 PM_{10} – Proposed Operations

The results indicate that ambient ground level concentrations of PM_{10}, detailed in Table 8.24, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient PM_{10} concentration (including background) which is at most:

- 30% of the annual limit value
- 48% of the 24-hour mean (measured as a 90.4th%ile) limit value

The geographical variation in the 24-hour mean (90.4th%ile) and annual mean PM_{10} ground level predicted environmental concentrations (PEC) beyond the facility boundary for the worst-case years modelled are illustrated as concentration contours in Figure 8.11 (annual mean) and Figure 8.12 (24-hr mean, as 90.4th%ile), to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for PM_{10} are also shown in these figures, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of particulate matter (PM_{10}) due to emissions from the Proposed Development on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.24. Proposed Operations – Dispersion Model Results for Particulate Matter (PM_{10})

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC A	Limit Value	
PM_{10} / 2020	Annual Mean	Boundary	676857, 5922166	0.06	12	12.06	40	30%
	24-hr Mean (as 90.4th%ile)	Boundary	676945, 5922440	0.11	24	24.11	50	48%
PM_{10} / 2021	Annual Mean	Boundary	676927, 5922407	0.08	12	12.08	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	676857, 5922266	0.12	24	24.12	50	48%
PM_{10} / 2022	Annual Mean	Boundary	676657, 5922315	0.04	12	12.04	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	678257, 5922316	0.11	24	24.11	50	48%
PM_{10} / 2023	Annual Mean	Boundary	676757, 5922316	0.05	12	12.05	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	676657, 5922416	0.14	24	24.14	50	48%
PM_{10} / 2024	Annual Mean	Boundary	676807, 5922366	0.06	12	12.06	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	676857, 5922366	0.11	24	24.11	50	48%

Figure 8.11 Proposed Operations Scenario - Annual Mean PM_{10} Concentration

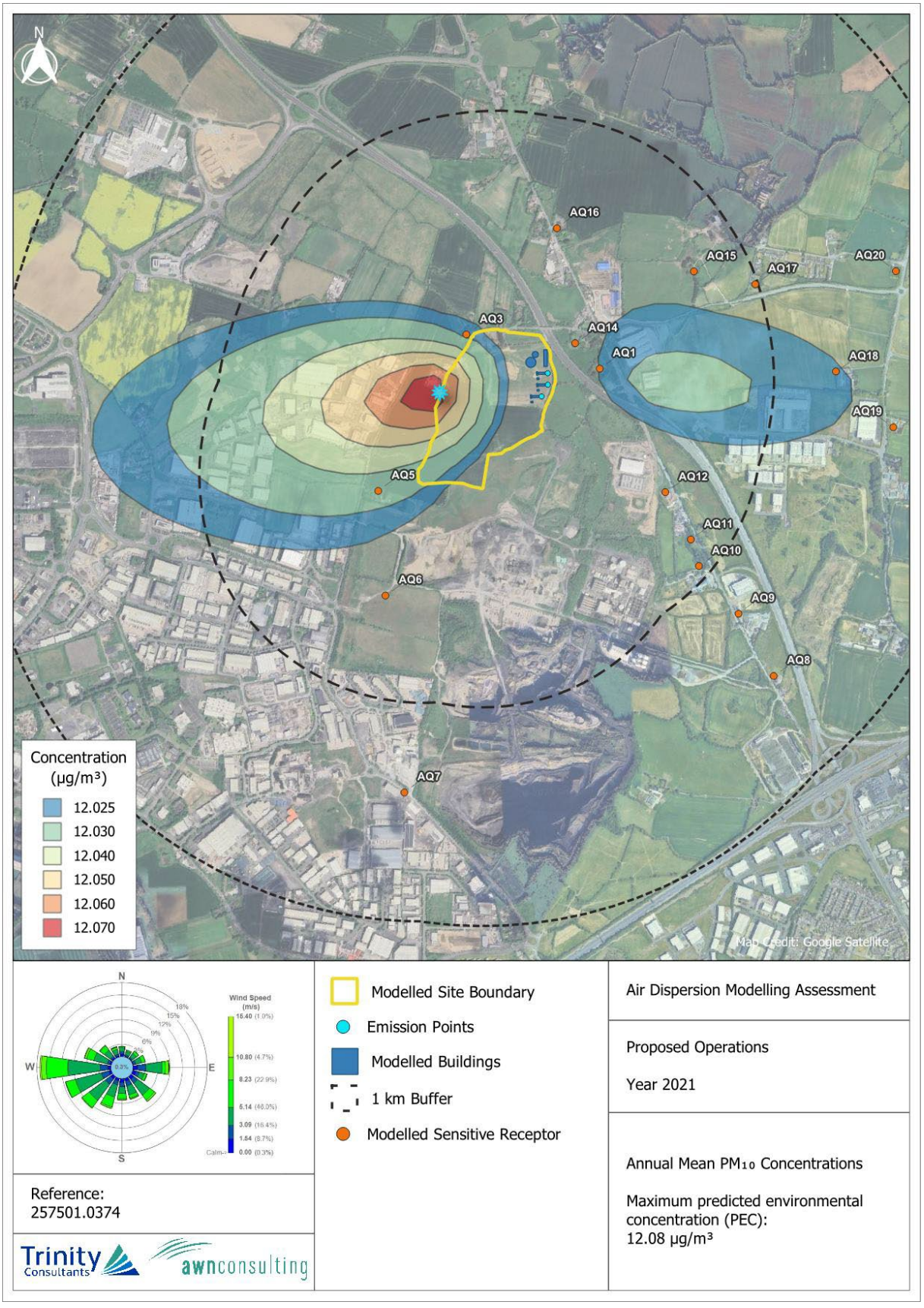
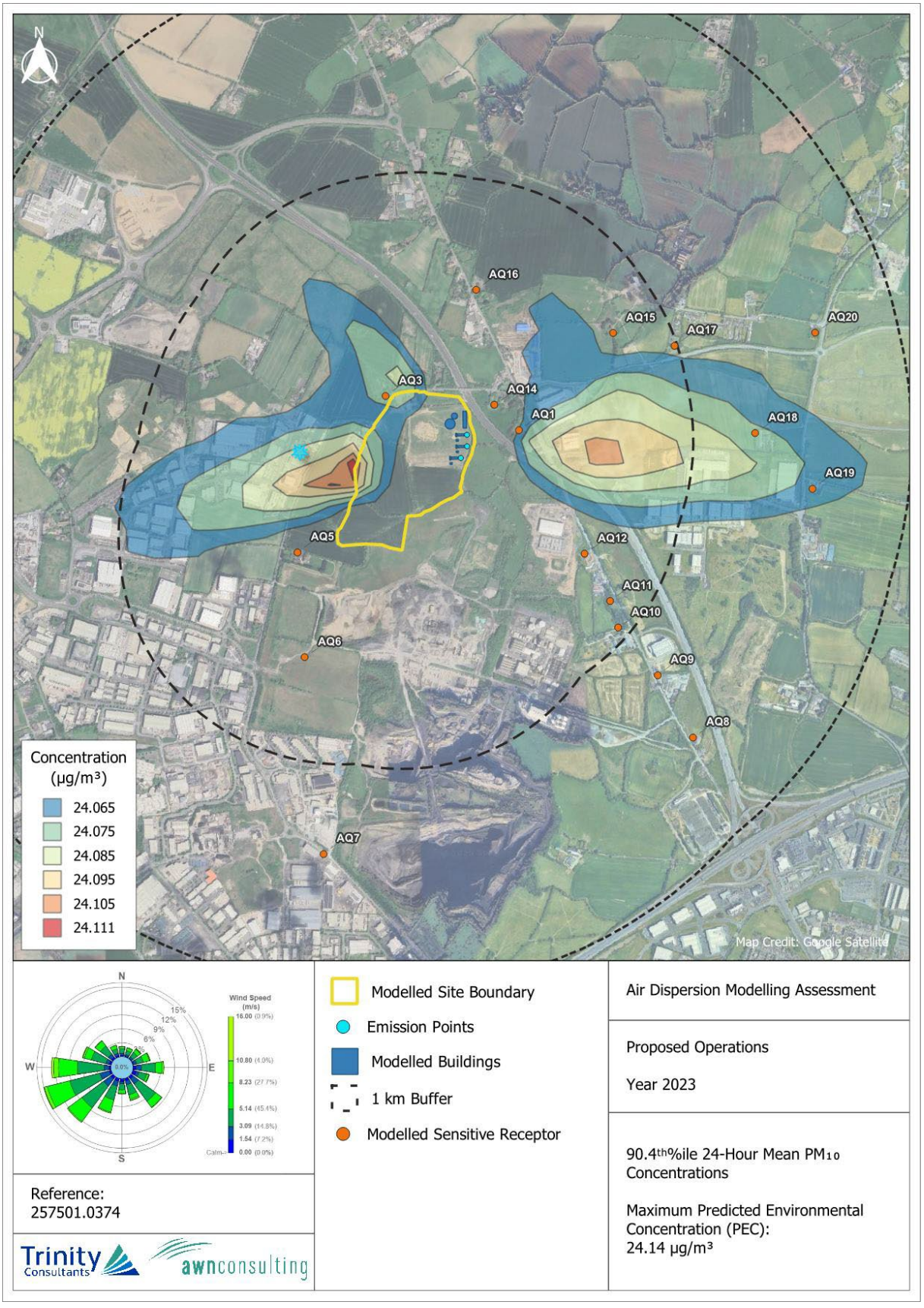


Figure 8.12 Proposed Operations Scenario - Maximum 24-Hour Mean PM_{10} Concentration



8.7.2.1.4 $PM_{2.5}$ – Proposed Operations

The results indicate that ambient ground level concentrations of $PM_{2.5}$, detailed in Table 8.25, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded, and sensitive receptors).

The modelled concentrations are derived from a worst-case assumption that all PM_{10} emissions from the facility are of a particle size of 2.5 microns or less ($PM_{2.5}$). This assumption is necessitated due to the lack of availability of $PM_{2.5}$ emission concentration data for emission sources and therefore $PM_{2.5}$ emissions could not be directly modelled. In reality, particles greater than 2.5 microns will also be present and thus the mass of $PM_{2.5}$ released has been overestimated.

For the worst-case year, emissions from the site lead to an ambient $PM_{2.5}$ concentration (including background) at the worst-case receptor which are at most:

- 28% of the annual mean $PM_{2.5}$ limit value.

As the annual mean $PM_{2.5}$ concentrations have been conservatively assumed equal to the annual mean PM_{10} concentrations, the direction and extent of the emission plume is identical to that shown in Figure 8.11.

Overall, the effect of particulate matter ($PM_{2.5}$) due to emissions from the Proposed Development on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.25. Proposed Operations – Dispersion Model Results for Particulate Matter ($PM_{2.5}$)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
$PM_{2.5}$ / 2020	Annual Mean	Boundary	676857, 5922166	0.04	7.00	7.04	25	28%
$PM_{2.5}$ / 2021	Annual Mean	Boundary	676927, 5922407	0.08	7.00	7.08	25	28%
$PM_{2.5}$ / 2022	Annual Mean	Boundary	676657, 5922315	0.06	7.00	7.06	25	28%
$PM_{2.5}$ / 2023	Annual Mean	Boundary	676757, 5922316	0.09	7.00	7.09	25	28%
$PM_{2.5}$ / 2024	Annual Mean	Boundary	676807, 5922366	0.03	7.00	7.03	25	28%

8.7.2.1.5 SO_2 – Proposed Operations

The results indicate that ambient ground level concentrations of SO_2, detailed in Table 8.26, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient $PM_{2.5}$ concentration (including background) at the worst-case receptor which are at most:

- 2% of the 1-hour mean (measured as a 99.7th%ile) limit value
- 4% of the 24-hour mean (measured as a 99.2nd%ile) limit value

The geographical variations in ground level SO_2 predicted environmental concentration (PEC) beyond the facility boundary for the worst-case years modelled are illustrated as concentration contours in Figure 8.13

(1-hr mean, as 99.7th%ile) and Figure 8.14 (24-hr mean, as 99.2nd%ile), to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for SO_2 are also shown in these figures, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of sulphur dioxide (SO_2) due to emissions from the Proposed Development on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.26. Proposed Operations – Dispersion Model Results for Sulphur Dioxide (SO_2)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
SO_2 / 2020	1-hr Mean (99.7th%ile)	Grid	677457, 5921316	6.91	4	17.81	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677457, 5921116	2.81	4	9.63	125	8%
SO_2 / 2021	1-hr Mean (99.7th%ile)	Grid	677457, 5921416	6.81	4	17.63	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677457, 5921416	5.11	4	14.21	125	11%
SO_2 / 2022	1-hr Mean (99.7th%ile)	Grid	677356, 5921316	5.60	4	15.19	350	4%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921216	3.02	4	10.05	125	8%
SO_2 / 2023	1-hr Mean (99.7th%ile)	Grid	677357, 5921416	5.99	4	15.97	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921316	2.92	4	9.85	125	8%
SO_2 / 2024	1-hr Mean (99.7th%ile)	Grid	677457, 5921416	6.89	4	17.78	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921416	3.68	4	11.37	125	9%

Figure 8.13 Proposed Operations Scenario - Maximum 1-Hour Mean SO_2 Concentrations (as 99.7th %ile)

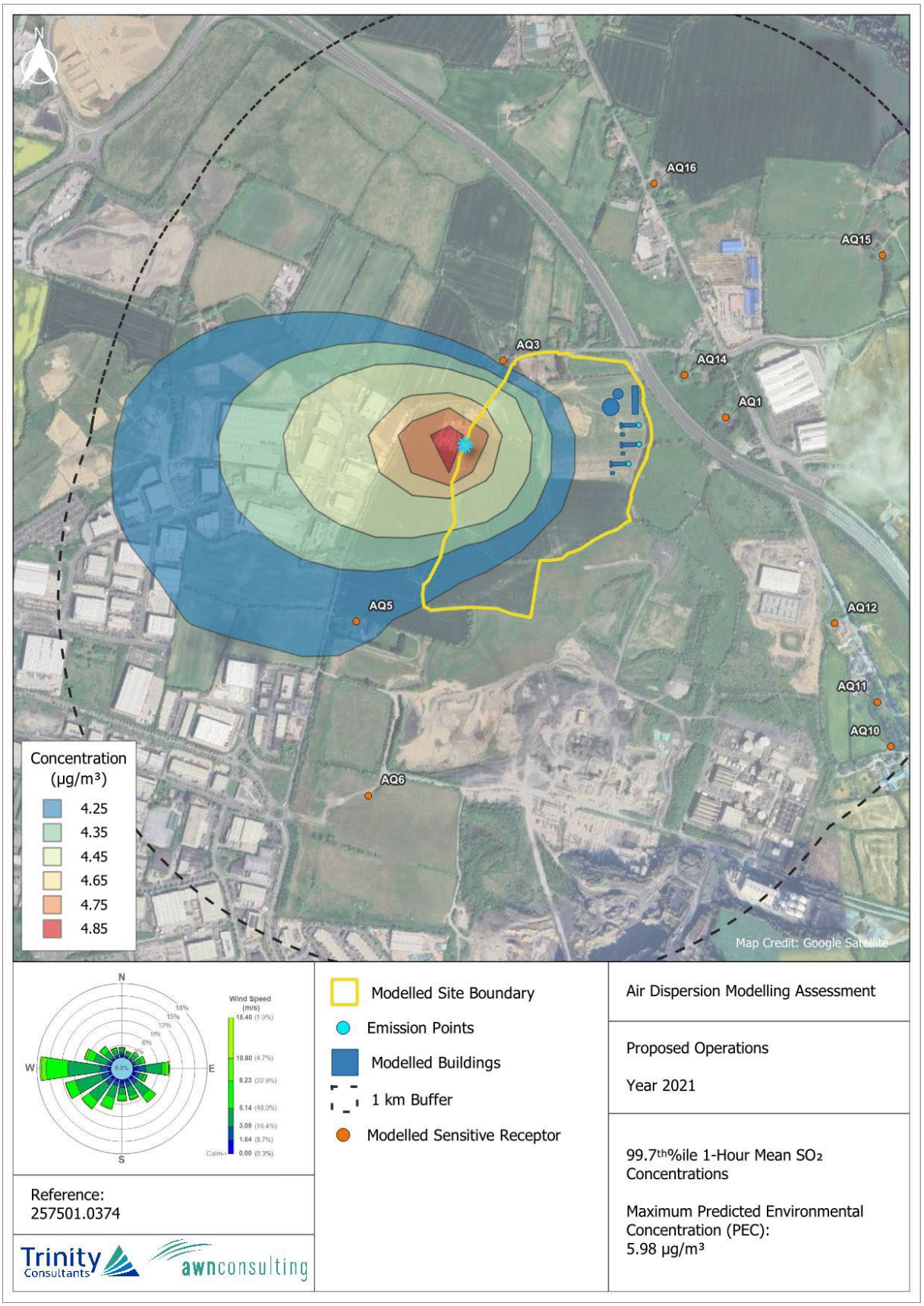
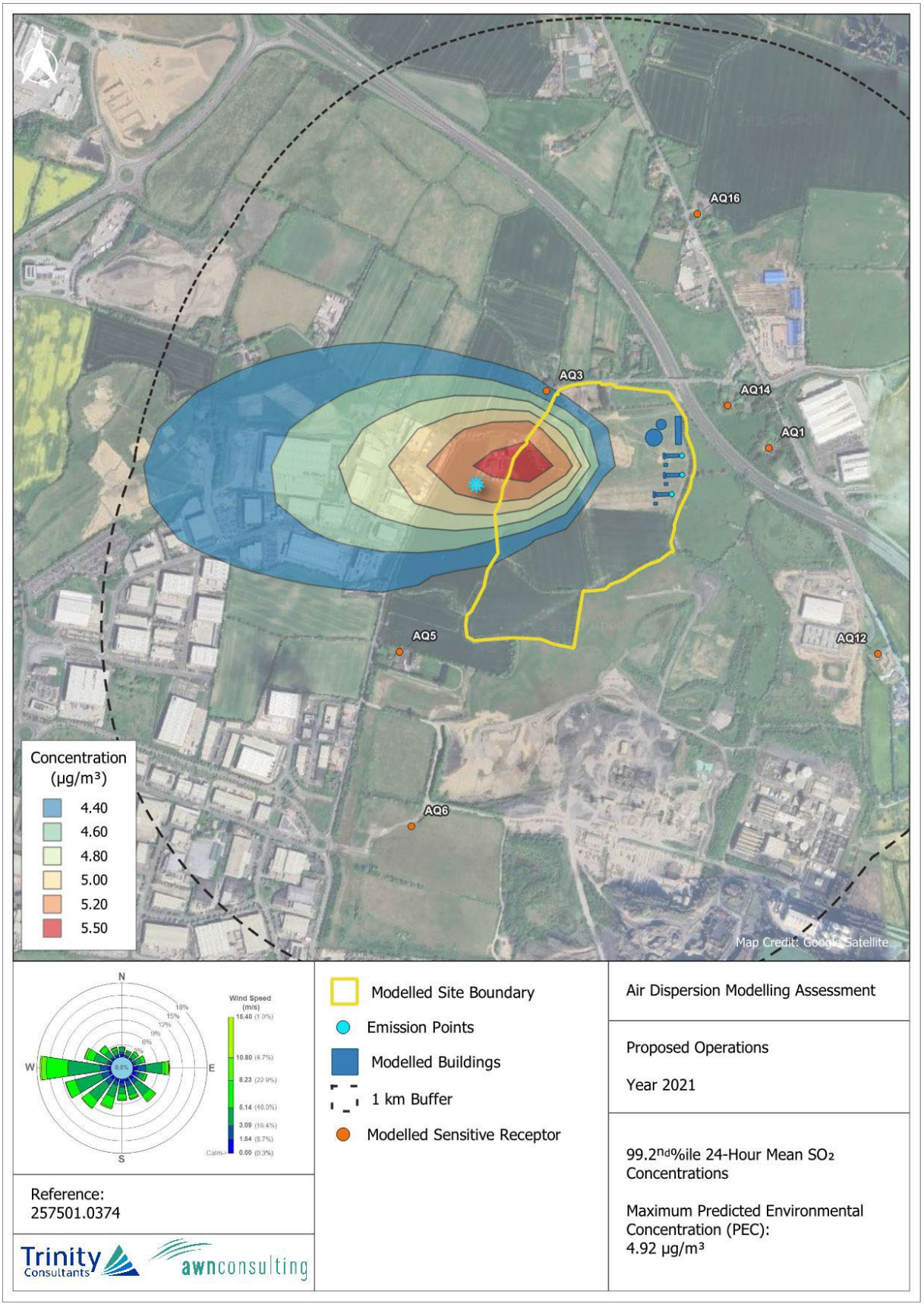


Figure 8.14 Proposed Operations Scenario - Maximum 24-Hour Mean SO_2 Concentrations (as 99.2nd %ile)



8.7.2.2 Air Dispersion Modelling Assessment – Ecology

8.7.2.2.1 NO_X

The NO_X modelling results for ecological receptors under the Proposed Operations scenario are detailed in Table 8.27 and Table 8.28.

As per Section 8.3.2.3, process contributions (PCs) of NO_X at ecological receptors were compared to the relevant critical level (identified in Section 8.3.2.1).

As per the IN2 guidance, where a PC is greater than 1% of the critical level, this site has been included in further assessment where the Predicted Environmental Concentrations (PEC) is determined by combining the background concentration with the PC. These results are presented below.

There are no PCs greater than 1% of the relevant critical level at any of the modelled ecological receptors, therefore no further assessment is required.

Within the most impacted European site (in terms of PEC) (South Dublin Bay and River Tolka Estuary SPA), at the worst-case location, cumulative emissions lead to a maximum ambient NO_X concentration (including background) which is at most 63% of the annual limit value site over the five years of meteorological data modelled.

Figure 8.15 shows the extent of the area, as a concentration contour, within which annual mean NO_X concentrations from the facility are greater than 1% of the critical level for NO_X of 30 µg/m^3.

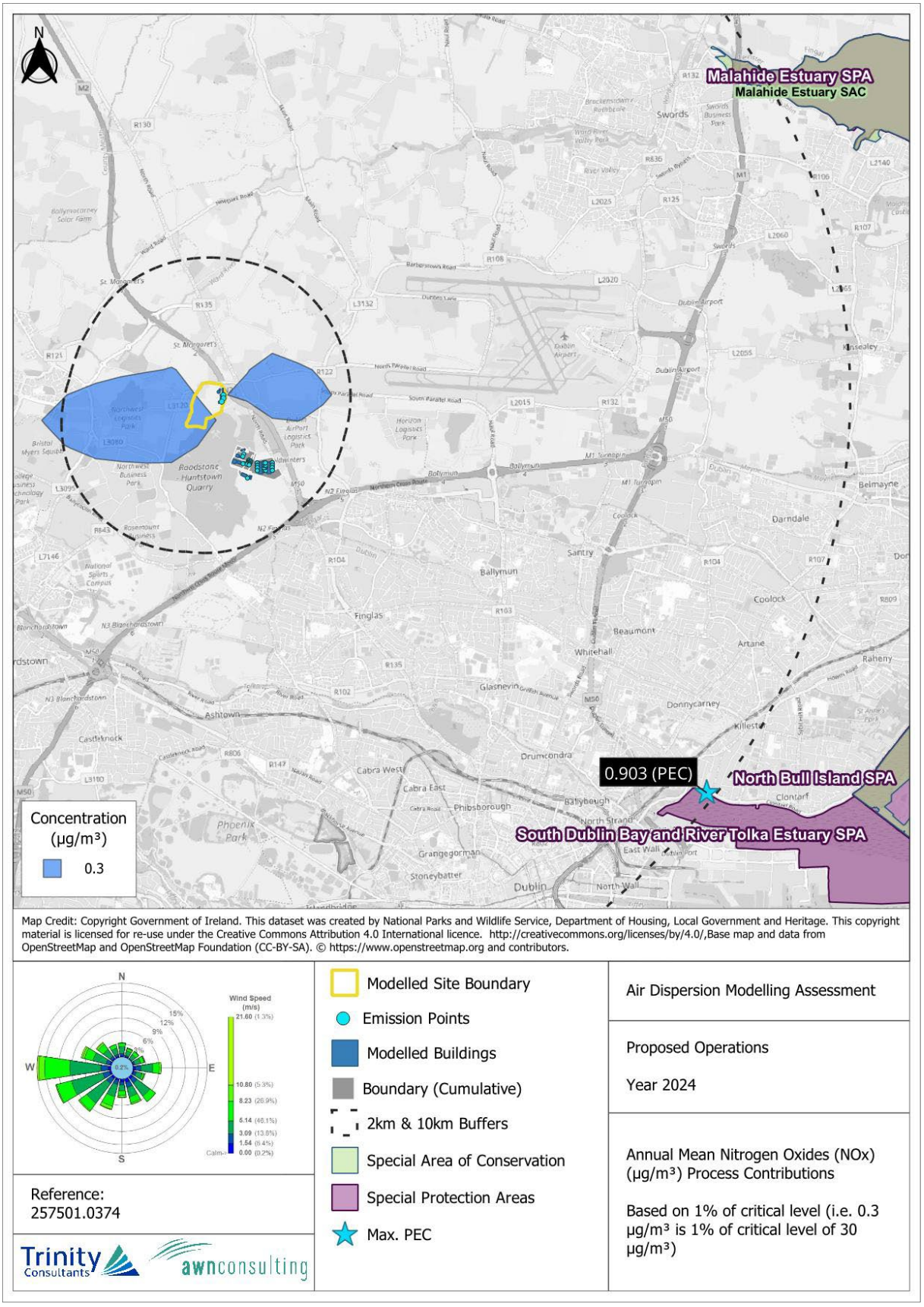
Table 8.27. Proposed Operations – NO_X Designated Habitat Dispersion Model Results

Ecological Receptor	NO_X Process Contributions (µg/m^3)					Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024	X	Y
Malahide Estuary SAC	0.11	0.10	0.10	0.12	0.10	685301	5927896
Malahide Estuary SPA	0.11	0.10	0.10	0.12	0.10	685581	5927628
South Dublin Bay and River Tolka Estuary SPA	0.06	0.06	0.06	0.06	0.07	685158	5916132

Table 8.28. Proposed Operations – NO_X Designated Habitat Dispersion Model Results (continued)

Ecological Receptor	Max. PC (µg/m^3)	Critical Level (µg/m^3)	Max PC % of Critical Level	Further assessment?	Back-ground (µg/m^3)	PEC (µg/m^3)	PEC % of critical level
Malahide Estuary SAC	0.12	30	0.4%	No	12.80	12.92	43%
Malahide Estuary SPA	0.12	30	0.4%	No	12.80	12.92	43%
South Dublin Bay and River Tolka Estuary SPA	0.07	30	0.2%	No	18.90	18.97	63%

Figure 8.15 Proposed Operations - NOx Process Contributions as 1% of Critical Level



8.7.2.2.2 SO_2

The SO_2 modelling results for ecological receptors under the Proposed Operations scenario are detailed in Table 8.29 and Table 8.30.

As per Section 8.3.2.3, process contributions (PCs) of NO_X at ecological receptors were compared to the relevant critical level (identified in Section 8.3.2.1).

As per the IN2 guidance, where a PC is greater than 1% of the critical level, this site has been included in further assessment where the Predicted Environmental Concentrations (PEC) is determined by combining the background concentration with the PC. These results are presented below.

There are no PCs greater than 1% of the relevant critical level at any of the modelled ecological receptors, therefore no further assessment is required.

Within the most impacted European site (in terms of PEC) (Malahide Estuary SAC and Malahide Estuary SPA), at the worst-case location, cumulative emissions lead to a maximum ambient SO_2 concentration (including background) which is at most 14% of the annual limit value site over the five years of meteorological data modelled.

The extent of the area, as a concentration contour, within which annual mean SO_2 concentrations from the facility are greater than 1% of the critical level for SO_2 of 20 µg/m^3, cannot be produced as the maximum concentration predicted by the modelling is 0.01 µg/m^3. This is considerably less than the 1% threshold of 0.2 µg/m^3 and would therefore not produce a contour at this concentration. This result confirms that there are no significant effects predicted as a result of SO_2 emissions.

Table 8.29. Proposed Operations – SO_2 Designated Habitat Dispersion Model Results

Ecological Receptor	SO_2 Process Contributions (µg/m^3)					Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024	X	Y
Malahide Estuary SAC	0.001	0.0012	0.017	0.018	0.017	686062	5927441
Malahide Estuary SPA	0.001	0.0012	0.017	0.018	0.017	685959	5927443
South Dublin Bay and River Tolka Estuary SPA	0.001	0.001	0.009	0.009	0.010	685158	5916132

Table 8.30. Proposed Operations – SO_2 Designated Habitat Dispersion Model Results (continued)

Ecological Receptor	Max. PC (µg/m^3)	Critical Level (µg/m^3)	Max PC % of Critical Level	Further assessment?	Back-ground (µg/m^3)	PEC (µg/m^3)	PEC % of critical level
Malahide Estuary SAC	0.02	20	0.09%	No	0.900	0.918	5%
Malahide Estuary SPA	0.02	20	0.09%	No	0.900	0.918	5%
South Dublin Bay and River Tolka Estuary SPA	0.01	20	0.05%	No	2.800	2.810	14%

8.7.2.2.3 Nitrogen Deposition

In order to consider the effects of nitrogen deposition (as N) owing to emissions from the facility on the European and National ecological receptors, the maximum annual mean NO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then nitrogen deposition fluxes (as described in Section 8.4.2.3) and shown in Table 8.31 and Table 8.32.

As per Section 8.3.2.3, process contributions (PCs) of nitrogen deposition at ecological receptors were compared to the relevant critical level (identified in Section 8.3.2.1).

There are no PCs greater than 1% of the relevant critical load at any of the modelled ecological receptors, therefore no further assessment is required.

Within the most impacted European site (South Dublin Bay and River Tolka Estuary SPA, in terms of PEC), at the worst-case location (shown in Figure 8.16), the maximum nitrogen deposition level is 6.309 kgN/ha/yr. This is within the critical load range of 5-10 kgN/ha/yr but above the lowest critical load of 5 kgN/ha/yr for the most sensitive features *Sterna dougallii (Europe - breeding), Sterna hirundo (Northern/Eastern Europe - breeding)* and *Sterna paradisaea (Arctic - breeding/Southern Oceans - wintering))*.

Figure 8.16 shows the extent of the area, as a concentration contour, within which nitrogen deposition levels from the facility are greater than 1% of the lowest critical load of 5 kgN/ha/yr. None of the sensitive features listed above are within the 1% contour, indicating that nitrogen deposition from the facility is unlikely to have a significant effect on these features.

Additionally, the maximum NO_2 process contributions from the facility, from which nitrogen deposition levels are derived, are below the limit of detection of 0.5 ug/m^3 which must be achieved by chemiluminescence-based automated NO_X/NO_2 analysers (EN 14211). Limit of detection is defined as the smallest concentration that can be reliably measured by an analytical procedure. The EPA guidelines (EPA, 2022) define an imperceptible effect as *"an effect capable of measurement but without significant consequences"*. NO_2 process contributions, and by extension nitrogen deposition levels, that are below a monitoring instrument's limit of detection are not measurable and will therefore have a less than imperceptible effect.

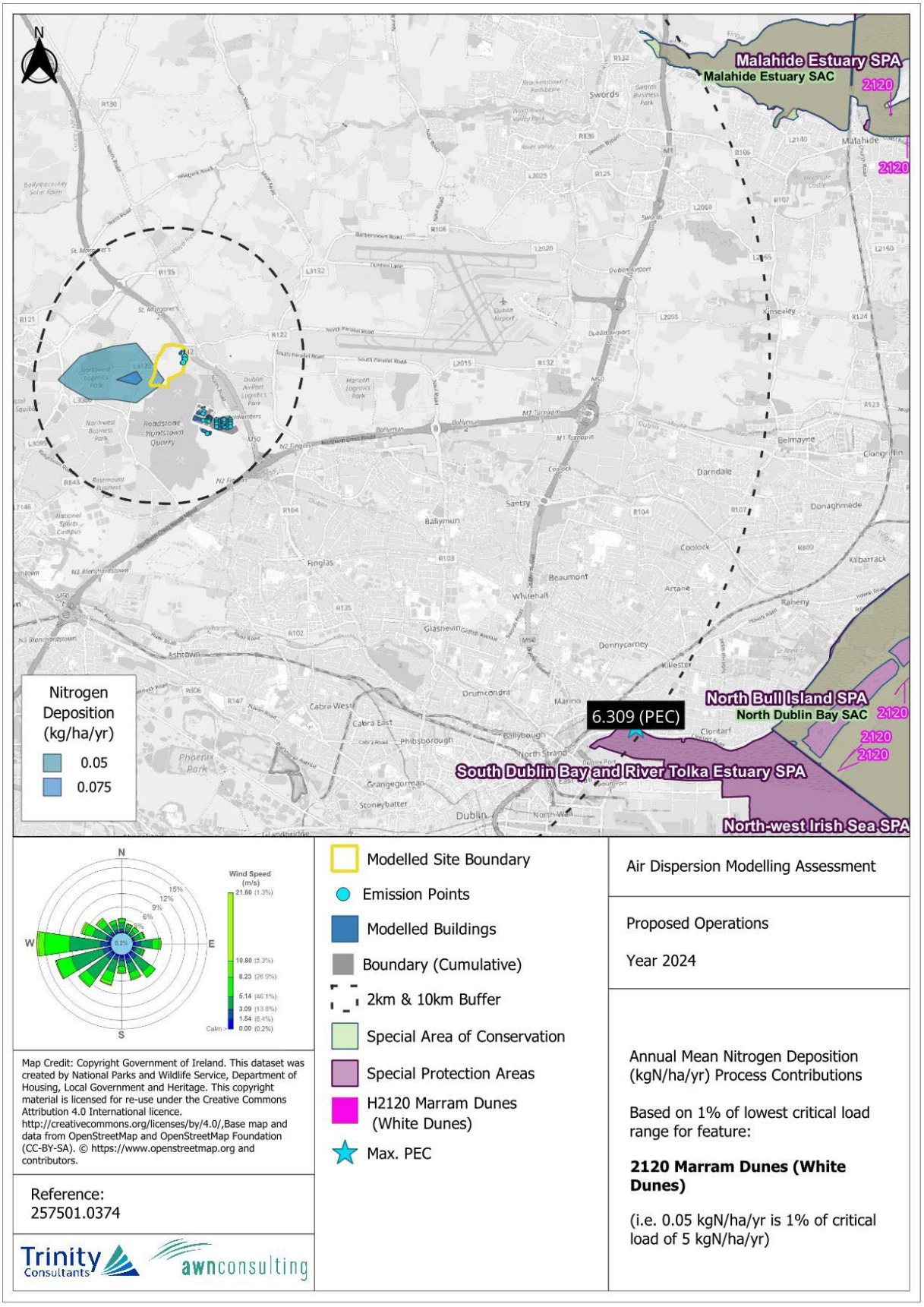
Table 8.31 Proposed Operations – Nitrogen Deposition Dispersion Model Results at Ecological Receptors

Ecological Receptor	NO_2 Process Contributions (µg/m^3)					NO_2 Dry Deposition (µg/m^2/s)	NO_2 Nitrogen Deposition (kg/ha/yr)
	2020	2021	2022	2023	2024		
Malahide Estuary SAC	0.09	0.09	0.09	0.10	0.09	0.0002	0.015
Malahide Estuary SPA	0.09	0.09	0.09	0.10	0.09	0.0002	0.015
South Dublin Bay and River Tolka Estuary SPA	0.05	0.05	0.05	0.05	0.06	0.0001	0.009

Table 8.32 Proposed Operations – Nitrogen Deposition Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	Total PC Nitrogen Dep. kgN/ha /yr)	Assessment critical load (kgN/ha /yr)	PC % of critical load	Further assessment?	APIS Background Nitrogen Dep. (kgN/ha /yr)	Total PEC Nitrogen Dep. (kgN/ha /yr)	Location of max. PC (UTM Zone 29 N)	
							X	Y
Malahide Estuary SAC	0.015	5.0	0.3%	Yes	5.600	5.615	520931	5833535
Malahide Estuary SPA	0.015	7.5	0.2%	Yes	5.600	5.615	520951	5820865
South Dublin Bay and River Tolka Estuary SPA	0.009	5.0	0.2%	Yes	6.300	6.309	520931	5833535

Figure 8.16 Proposed Operations – Nitrogen Deposition Process Contributions as 1% of Critical Load (5 kg/ha/yr)



8.7.2.2.4 Acid Deposition (as N)

In order to consider the effects of acid deposition (as N) owing to emissions from the facility on the most impacted ecological receptors, the maximum annual mean NO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then acid deposition fluxes (as described in Section 8.4.2.2) and shown in Table 8.33 and Table 8.34.)

As per Section 8.3.2.3, process contributions (PCs) of nitrogen deposition at ecological receptors were compared to the relevant critical level (identified in Section 8.3.2.1).

There are no PCs greater than 1% of the relevant critical load at any of the modelled ecological receptors, therefore no further assessment is required.

Within the most impacted European site (Malahide Estuary SPA, in terms of PEC), at the worst-case location (shown in Figure 8.17), the maximum acid deposition (as N) level is 0.501 keq/ha/yr. This is below the lowest assessment criteria critical load of 0.714 keq/ha/yr for the most sensitive feature *Podiceps cristatus (North-western Europe - wintering)*.

Figure 8.17 shows the extent of the area, as a concentration contour, within which nitrogen deposition levels from the facility are greater than 1% of the lowest critical load of 0.143 keq/ha/yr. None of the sensitive features listed above are within the 1% contour, indicating that acid deposition (as N) from the facility is unlikely to have a significant effect on these features.

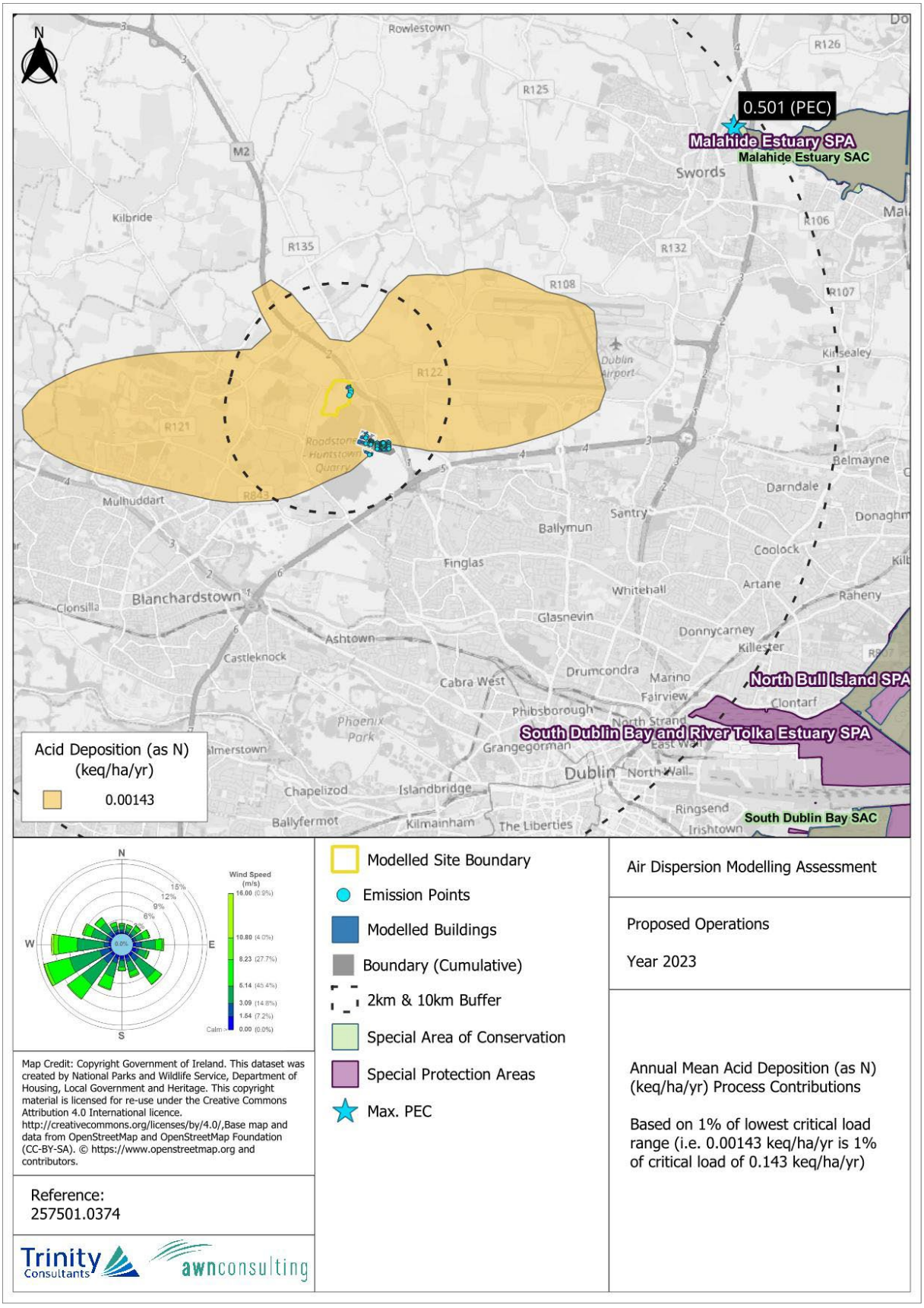
Table 8.33 Proposed Operations – Acid Deposition (as N) Dispersion Model Results at Ecological Receptors

Ecological Receptor	NO_2 Process Contributions ($\mu g/m^3$)					NO_2 Dry Deposition ($\mu g/m^2/s$)	NO_2 Acid Deposition (N) (keq/ha/yr)	Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024			X	Y
Natura 2000									
Malahide Estuary SAC	0.09	0.09	0.09	0.10	0.09	0.00016	0.001	520931	5833535
Malahide Estuary SPA	0.09	0.09	0.09	0.10	0.09	0.00016	0.001	520951	5820865
South Dublin Bay and River Tolka Estuary SPA	0.05	0.05	0.05	0.05	0.06	0.00009	0.001	520931	5833535

Table 8.34 Proposed Operations – Acid Deposition (as N) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	PC Acid Dep. (N) (keq/ha/yr)	Critical load (MinCL minN) for PC (keq/ha/yr)	PC % of critical load	Considered for further assessment?	APIS Back-ground Acid Dep. (keq/ha/yr)	Total PEC Acid Dep. (N) (keq/ha/yr)	Critical load (MaxCL minN) for PEC (keq/ha/yr)
Natura 2000							
Malahide Estuary SAC	0.0011	0.143	0.8%	No	0.400	0.401	0.714
Malahide Estuary SPA	0.0011	0.143	0.8%	No	0.500	0.501	0.714
South Dublin Bay and River Tolka Estuary SPA	0.0006	0.143	0.4%	No	0.400	0.401	0.714

Figure 8.17 Proposed Operations – Acid Deposition (as N) Process Contributions as 1% of Critical Load (0.143 keq/ha/yr)



8.7.2.2.5 Acid Deposition (as S)

In order to consider the effects of acid deposition (as S) owing to emissions from the facility on ecological habitat sites, the maximum annual mean SO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then acid deposition fluxes (as described in Section 8.4.2.3).

As per Section 8.3.2.3, process contributions (PCs) of acid deposition (as S) at Natura 2000 and nationally designated sites were compared to the relevant critical load (identified in Section 8.3.2.2), and are shown in Table 8.35 and Table 8.36.

There are no PCs greater than 1% of the relevant critical load at any of the modelled ecological receptors, therefore no further assessment is required. The effect of acid deposition (as S) due to emissions from the proposed development on sensitive ecological receptors is therefore considered to not significant.

Within the most impacted European site (Malahide Estuary SPA, in terms of PEC), at the worst-case location, the maximum acid deposition (as S) level is 0.502 keq/ha/yr. This is below the lowest assessment criteria critical load of 4.117 keq/ha/yr for the most sensitive feature *Podiceps cristatus (North-western Europe - wintering)*.

The extent of the area, as a concentration contour, within which acid deposition (as S) levels concentrations from the facility are greater than 1% of the lowest critical load for SO_2 of 0.04117 keq/ha/yr, cannot be produced as the maximum concentration predicted by the modelling is 0.0022 keq/ha/yr. This is considerably less than the 1% threshold of 0.04117 keq/ha/yr and would therefore not produce a contour at this concentration. This result confirms that there are no significant effects predicted as a result of acid deposition (as S) emissions.

Table 8.35 Proposed Operations – Acid Deposition (as S) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	SO_2 Process Contributions (µg/m³)					SO_2 Dry Deposition (µg/m²/s)	SO_2 Acid Deposition (as S) (keq/ha/yr)	Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024			X	Y
Natura 2000									
Malahide Estuary SAC	0.001	0.001	0.017	0.018	0.017	0.0002	0.0022	520931	5833535
Malahide Estuary SPA	0.001	0.001	0.017	0.018	0.017	0.0002	0.0022	520951	5820865
South Dublin Bay and River Tolka Estuary SPA	0.001	0.001	0.009	0.009	0.010	0.0001	0.0012	520931	5833535

Table 8.36 Proposed Operations – Acid Deposition (as S) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	PC Acid Dep. (S) (keq/ha/yr)	Critical load (MinCL maxS) (keq/ha/yr)	PC % of critical load	Considered for further assessment?	APIS Back-ground Acid Dep. (keq/ha/yr)	Total PEC Acid Dep. (S) (keq/ha/yr)
Natura 2000						
Malahide Estuary SAC	0.0022	4.117	0.05%	No	0.400	0.402
Malahide Estuary SPA	0.0022	4.117	0.05%	No	0.500	0.502

Ecological Receptor	PC Acid Dep. (S) (keq/ha/yr)	Critical load (MinCL maxS) (keq/ha/yr)	PC % of critical load	Considered for further assessment?	APIS Back-ground Acid Dep. (keq/ha/yr)	Total PEC Acid Dep. (S) (keq/ha/yr)
South Dublin Bay and River Tolka Estuary SPA	0.0012	4.099	0.03%	No	0.400	0.401

8.7.3 Cumulative Effects

8.7.3.1 Construction Phase

As per the IAQM guidance (IAQM, 2024), there is the potential for cumulative construction dust impacts to nearby sensitive receptors if the construction phase of the proposed project coincides with that of other developments with significant dust generating potential within 500 m of the site.

A review of the planned and permitted projects within 500 m of the site was undertaken (see Chapter 2 and Appendix 2.1) in order to identify developments with the potential for cumulative construction phase impacts. The following developments in were identified to be of sufficient scale to potentially generative cumulative dust impacts with the proposed development.

Table 8-37 Summary of Committed Developments with Potential for Cumulative Effects

Planning Reference No.	Description
FW24A/0339E / PL06F.321196	Demolition of two no. existing detached dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89) and associated garages and shed structures, and permission for the use of the subject site (c. 2.52 Ha) as a storage container depot with a maximum capacity of c. 1,270 no. containers in 9 no. blocks ranging in height between 3 no. and 6 no. containers high, and associated works.
VA06F.314894	Proposed development of a 220kV Gas Insulated Switchgear (GIS) substation on lands at Kilshane Road, and an underground 220kV transmission line connection to the existing Cruiserath 220kV substation.

Additionally, the 2 no. additional turbines proposed as part of the Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that EirGrid will submit an application for a new gridline in due course. This application will be accompanied by an Environmental Impact Assessment Report (EIAR). This future development has been considered for its potential for cumulative dust effects.

No significant effects on air quality as a result of construction dust during the construction phases of the permitted developments in Table 8-37 as part of their respective impact assessments, and similar dust mitigation measures are required as per their planning conditions to ensure there are no significant effects (i.e. construction works must be carried out with dust mitigation applied or the development will be in breach of its planning conditions).

The dust mitigation measures outlined in Section 8.8 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. Similar dust mitigation measures are required for other permitted developments as per their respective impact assessments and planning conditions. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with

the construction phase of the Proposed Development is ***short-term, direct, negative*** and ***not significant***. No significant cumulative impacts to air quality predicted for the construction phase.

8.7.3.2 Operational Phase

A cumulative air dispersion modelling assessment of operational phase emissions from the proposed development and other nearby industrial sites with relevant air emissions and an IE license was undertaken, the results of which are detailed in the following sections.

8.7.3.2.1 Air Dispersion Modelling Assessment – Human Health

NO_2 - Cumulative Assessment

The results indicate that ambient ground level concentrations of NO_2, detailed in Table 8.38, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient NO_2 concentration (including background) at the worst-case receptor which are at most:

- 75% of the annual limit value,
- 50% of the 1-hour mean (measured as a 99.8th percentile) limit value.

The geographical variations in ground level NO_2 predicted environmental concentrations (PEC) beyond the facility boundary for the worst-case year modelled are illustrated as concentration contours in Figure 8.18 and Figure 8.19, to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for NO_2 are also shown in these figures, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of nitrogen dioxide (NO_2) due to cumulative emissions on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.38 Cumulative Assessment – Dispersion Model Results for Nitrogen Dioxide (NO_2)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
NO_2 / 2020	Annual Mean	Boundary	678245, 5921430	16.9	13	29.9	40	75%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	70.3	26	96.3	200	48%
NO_2 / 2021	Annual Mean	Boundary	678257, 5921415	15.7	13	28.7	40	72%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	73.2	26	99.2	200	50%
NO_2 / 2022	Annual Mean	Boundary	678245, 5921430	16.4	13	29.4	40	74%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	72.1	26	98.1	200	49%
NO_2 / 2023	Annual Mean	Boundary	678245, 5921430	16.6	13	29.6	40	74%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	73.0	26	99.0	200	49%

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
NO_2 / 2024	Annual Mean	Boundary	678257, 5921415	16.2	13	29.2	40	73%
	99.8th %ile of 1-hr means	Boundary	678245, 5921430	71.4	26	97.4	200	49%

Figure 8.18 Cumulative Assessment - Annual Mean NO_2 Concentrations

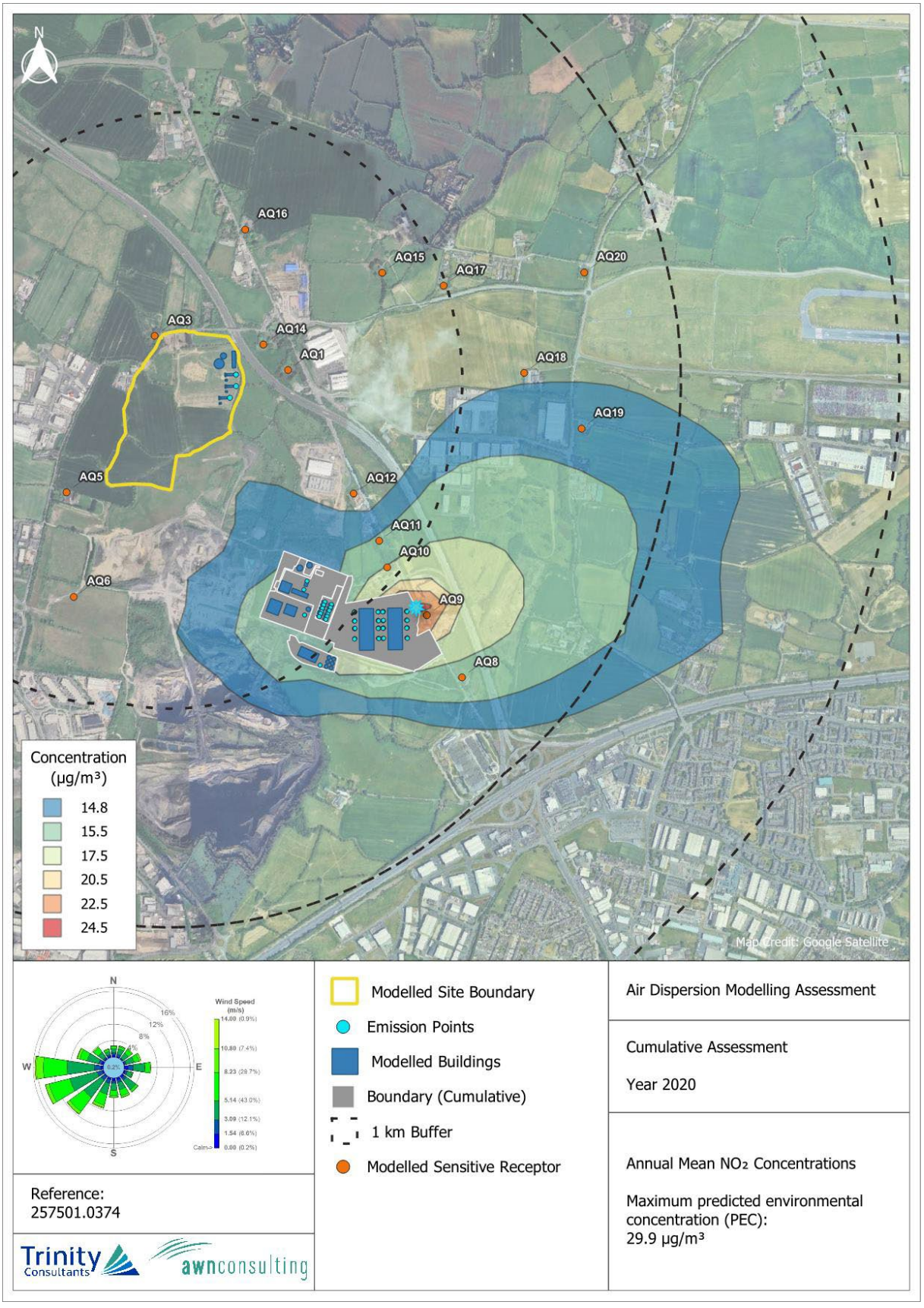
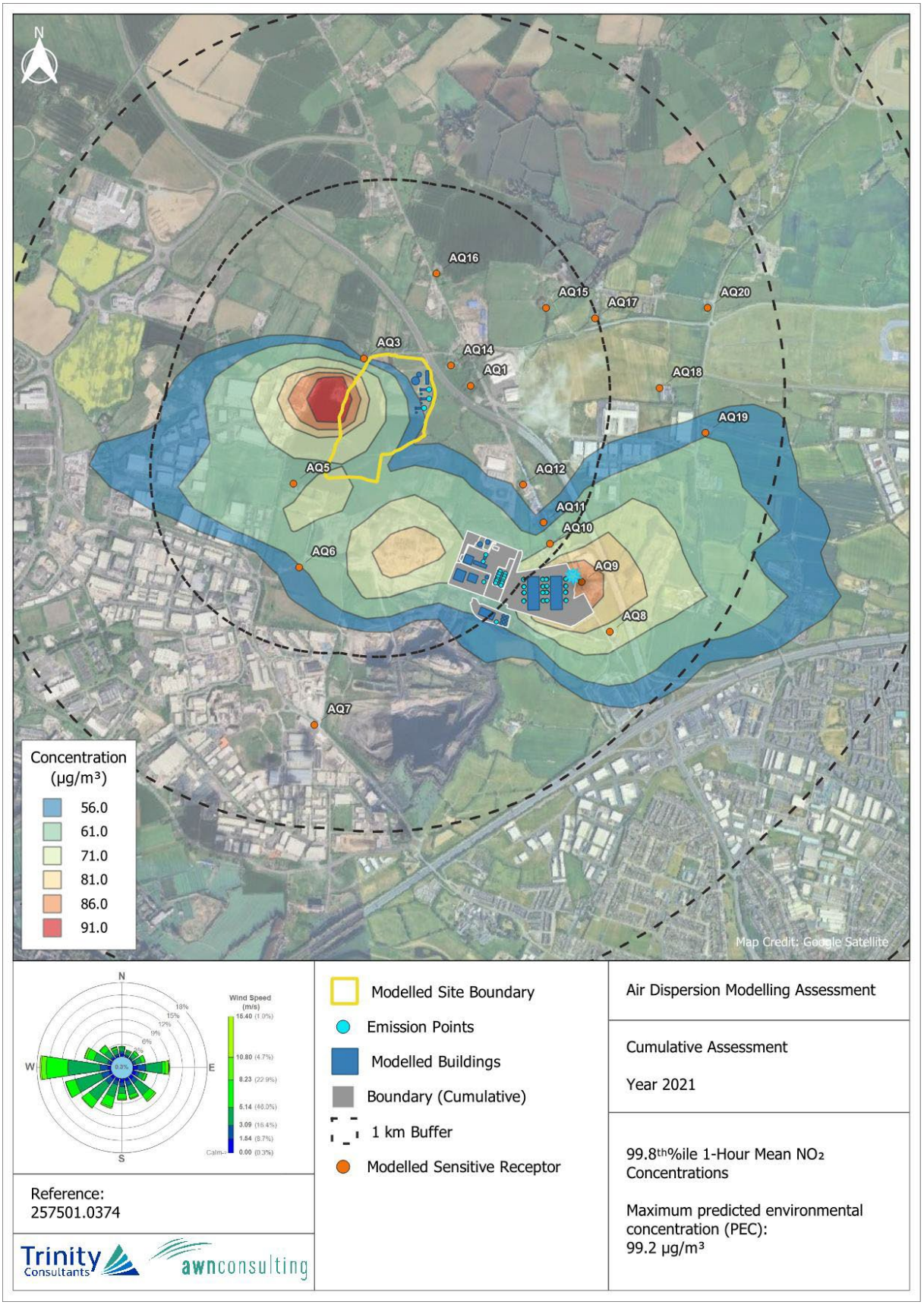


Figure 8.19 Cumulative Assessment - Maximum 1-Hour NO_2 Concentrations (as 99.8th%ile)



PM_{10} - Cumulative Assessment

The results indicate that ambient ground level concentrations of PM_{10}, detailed in Table 8.39, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient PM_{10} concentration (including background) which is at most:

- 30% of the annual limit value
- 48% of the 24-hour mean (measured as a 90.4th%ile) limit value

The geographical variation in the 24-hour mean (90.4th%ile) and annual mean PM_{10} ground level predicted environmental concentrations (PEC) beyond the facility boundary for the worst-case years modelled are illustrated as concentration contours in Figure 8.20 (annual mean) and Figure 8.21 (24-hr mean, as 90.4th%ile), to demonstrate the direction and extent of the emission plume.

Overall, the effect of particulate matter (PM_{10}) due to cumulative emissions on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.39. Cumulative Assessment – Dispersion Model Results for Particulate Matter (PM_{10})

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
PM_{10} / 2020	Annual Mean	Boundary	676889, 5922181	0.06	12	12.06	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	677057, 5921116	0.14	24	24.14	50	48%
PM_{10} / 2021	Annual Mean	Boundary	676927, 5922407	0.09	12	12.09	40	30%
	24-hr Mean (as 90.4th%ile)	Boundary	676920, 5922364	0.13	24	24.13	50	48%
PM_{10} / 2022	Annual Mean	Boundary	676756, 5922315	0.04	12	12.04	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	678357, 5922316	0.12	24	24.12	50	48%
PM_{10} / 2023	Annual Mean	Boundary	676807, 5922366	0.06	12	12.06	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	676757, 5922366	0.15	24	24.15	50	48%
PM_{10} / 2024	Annual Mean	Boundary	676807, 5922366	0.06	12	12.06	40	30%
	24-hr Mean (as 90.4th%ile)	Grid	677157, 5921216	0.12	24	24.12	50	48%

Figure 8.20 Cumulative Assessment - Annual Mean PM_{10} Concentration

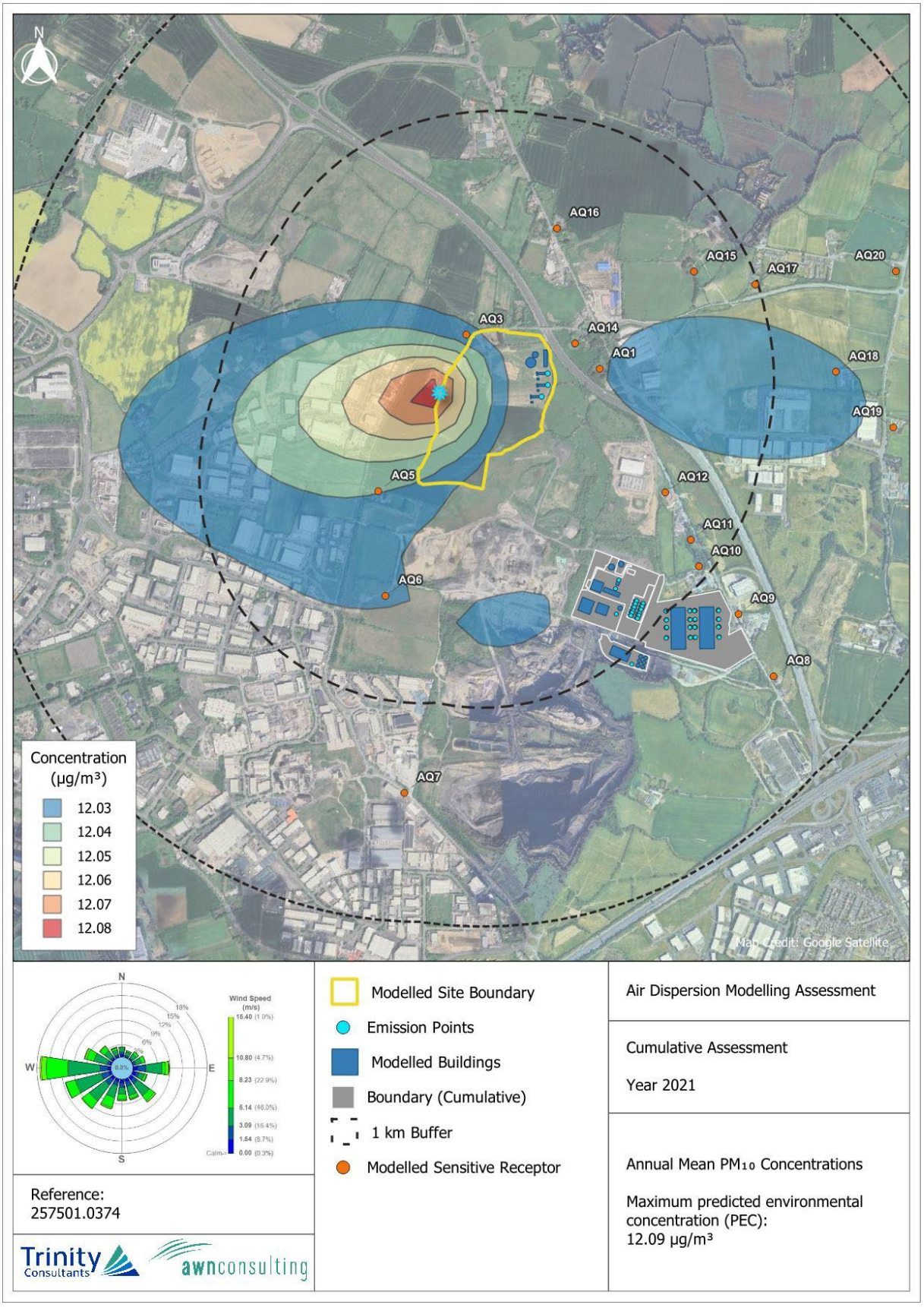
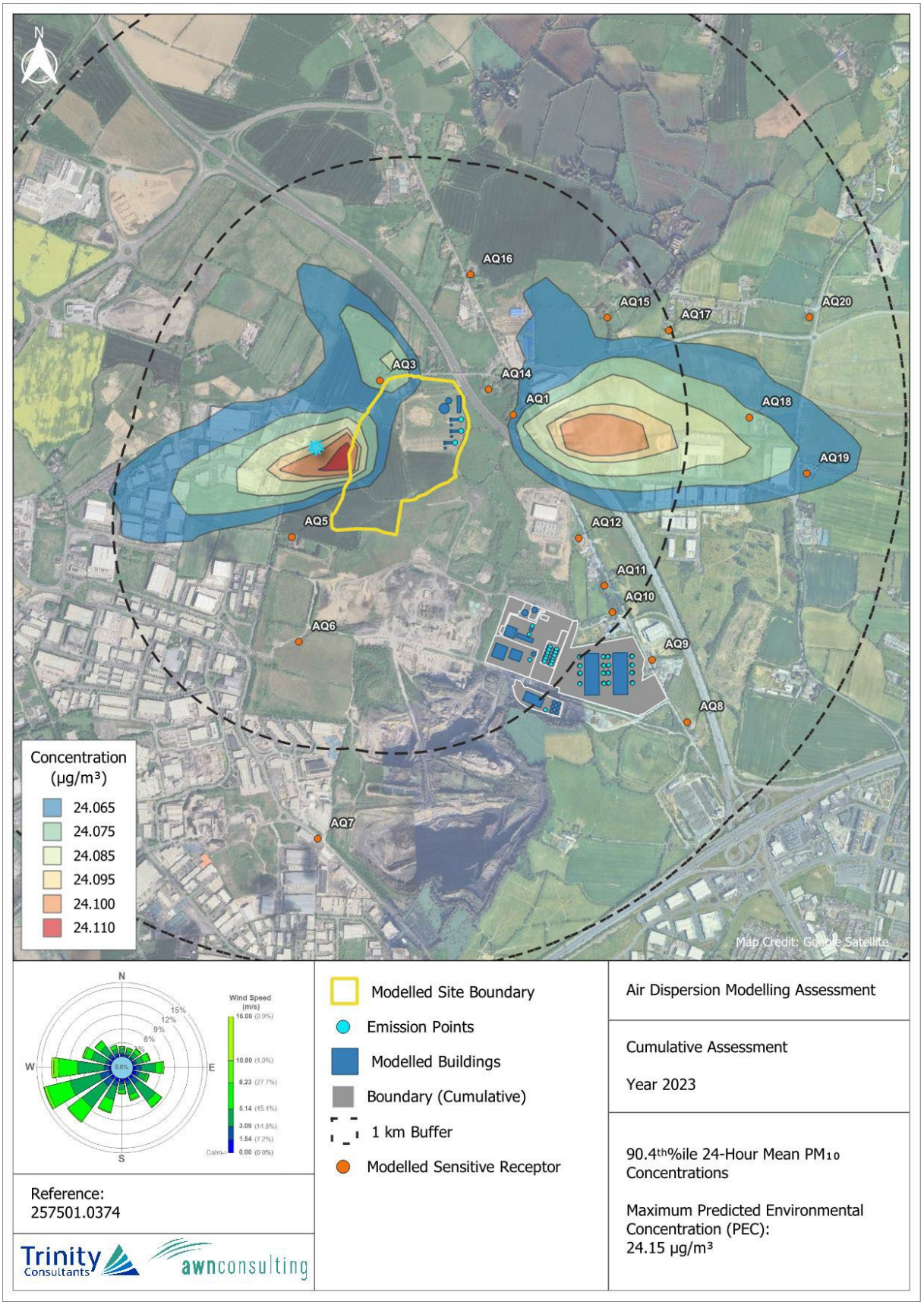


Figure 8.21 Cumulative Assessment - Maximum 24-Hour Mean PM_{10} Concentration



$PM_{2.5}$ – Cumulative Assessment

The results indicate that ambient ground level concentrations of $PM_{2.5}$, detailed in Table 8.40, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded, and sensitive receptors).

The modelled concentrations are derived from a worst-case assumption that all PM_{10} emissions from the facility are of a particle size of 2.5 microns or less ($PM_{2.5}$). This assumption is necessitated due to the lack of availability of $PM_{2.5}$ emission concentration data for emission sources and therefore $PM_{2.5}$ emissions could not be directly modelled. In reality, particles greater than 2.5 microns will also be present and thus the mass of $PM_{2.5}$ released has been overestimated.

For the worst-case year, emissions from the site lead to an ambient $PM_{2.5}$ concentration (including background) at the worst-case receptor which are at most:

- 28% of the annual mean $PM_{2.5}$ limit value.

As the annual mean $PM_{2.5}$ concentrations have been conservatively assumed equal to the annual mean PM_{10} concentrations, the direction and extent of the emission plume is identical to that shown in Figure 8.20.

Overall, the effect of particulate matter ($PM_{2.5}$) due to cumulative emissions on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.40. Cumulative Assessment – Dispersion Model Results for Particulate Matter ($PM_{2.5}$)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
$PM_{2.5}$ / 2020	Annual Mean	Boundary	676889, 5922181	0.05	7	7.05	25	28%
$PM_{2.5}$ / 2021	Annual Mean	Boundary	676927, 5922407	0.06	7	7.06	25	28%
$PM_{2.5}$ / 2022	Annual Mean	Boundary	676756, 5922315	0.03	7	7.03	25	28%
$PM_{2.5}$ / 2023	Annual Mean	Boundary	676807, 5922366	0.04	7	7.04	25	28%
$PM_{2.5}$ / 2024	Annual Mean	Boundary	676807, 5922366	0.05	7	7.05	25	28%

SO_2 - Cumulative Assessment

The results indicate that ambient ground level concentrations of SO_2, detailed in Table 8.41, are in compliance with the relevant air quality standards for all modelled years at the worst-case receptor (considers boundary, gridded and sensitive receptors).

For the worst-case year, emissions from the site lead to an ambient $PM_{2.5}$ concentration (including background) at the worst-case receptor which are at most:

- 5% of the 1-hour mean (measured as a 99.7th%ile) limit value
- 11% of the 24-hour mean (measured as a 99.2nd%ile) limit value

The geographical variations in ground level SO_2 predicted environmental concentration (PEC) beyond the facility boundary for the worst-case years modelled are illustrated as concentration contours in Figure 8.22 (1-hr mean, as 99.7th%ile) and Figure 8.23 (24-hr mean, as 99.2nd%ile), to demonstrate the direction and extent of the emission plume. The locations of the maximum concentrations for SO_2 are also shown in these figures, and are close to the boundary of the site with concentrations decreasing with distance from the facility.

Overall, the effect of sulphur dioxide (SO_2) due to cumulative emissions on sensitive human health receptors is considered to be ***direct, long-term, negative*** and ***not significant***.

Table 8.41. Cumulative Assessment – Dispersion Model Results for Sulphur Dioxide (SO_2)

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m^3)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
SO_2 / 2020	1-hr Mean (99.7th%ile)	Grid	677457, 5921316	6.91	4	17.81	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677457, 5921116	2.81	4	9.63	125	8%
SO_2 / 2021	1-hr Mean (99.7th%ile)	Grid	677457, 5921416	6.81	4	17.63	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677457, 5921416	5.11	4	14.21	125	11%
SO_2 / 2022	1-hr Mean (99.7th%ile)	Grid	677356, 5921316	5.60	4	15.19	350	4%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921216	3.02	4	10.05	125	8%
SO_2 / 2023	1-hr Mean (99.7th%ile)	Grid	677357, 5921416	5.99	4	15.97	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921316	2.92	4	9.85	125	8%
SO_2 / 2024	1-hr Mean (99.7th%ile)	Grid	677457, 5921416	6.89	4	17.78	350	5%
	24-hr Mean (99.2nd%ile)	Grid	677357, 5921416	3.68	4	11.37	125	9%

Figure 8.22 Cumulative Assessment - Maximum 1-Hour Mean SO_2 Concentrations (as 99.7th %ile)

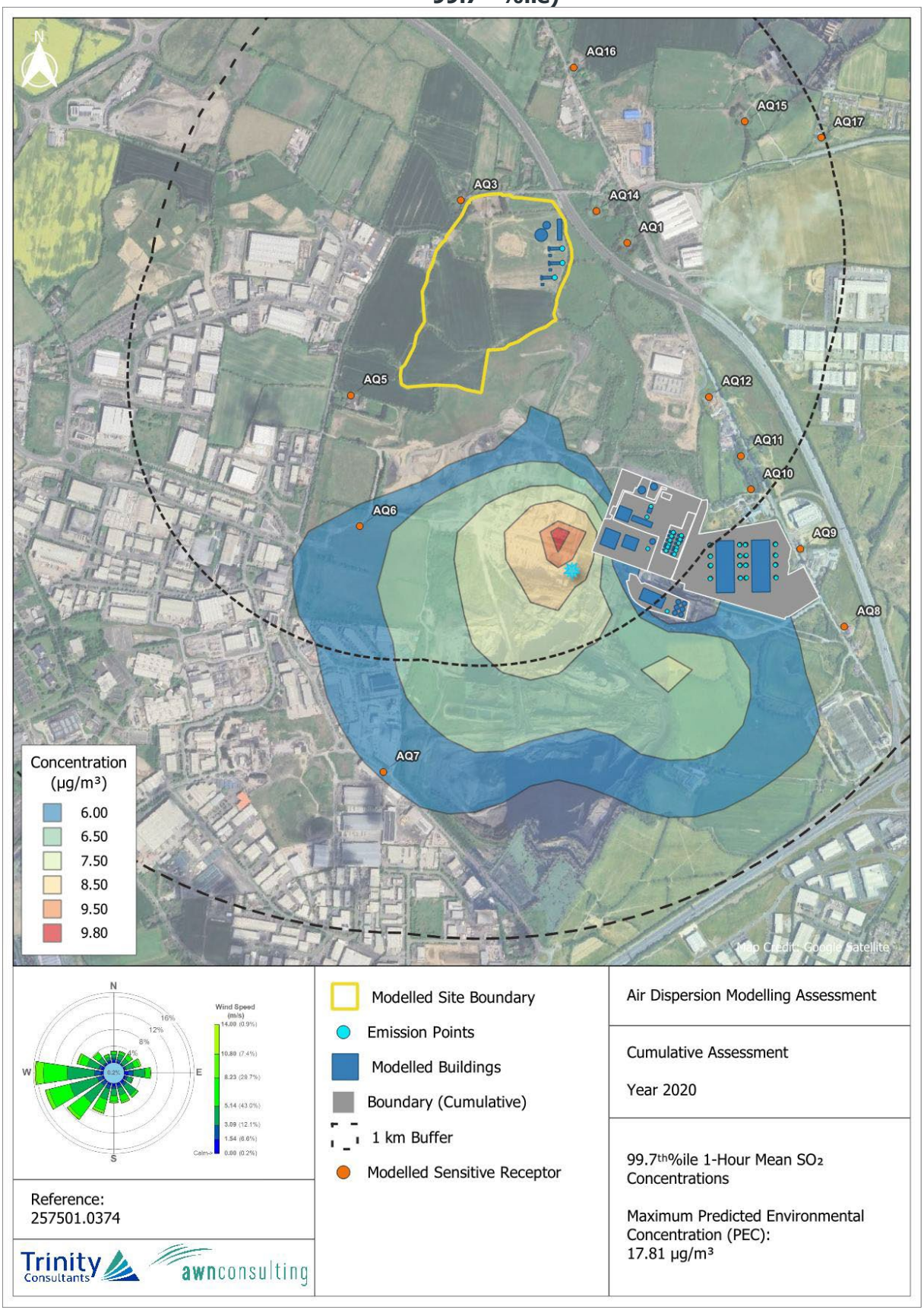
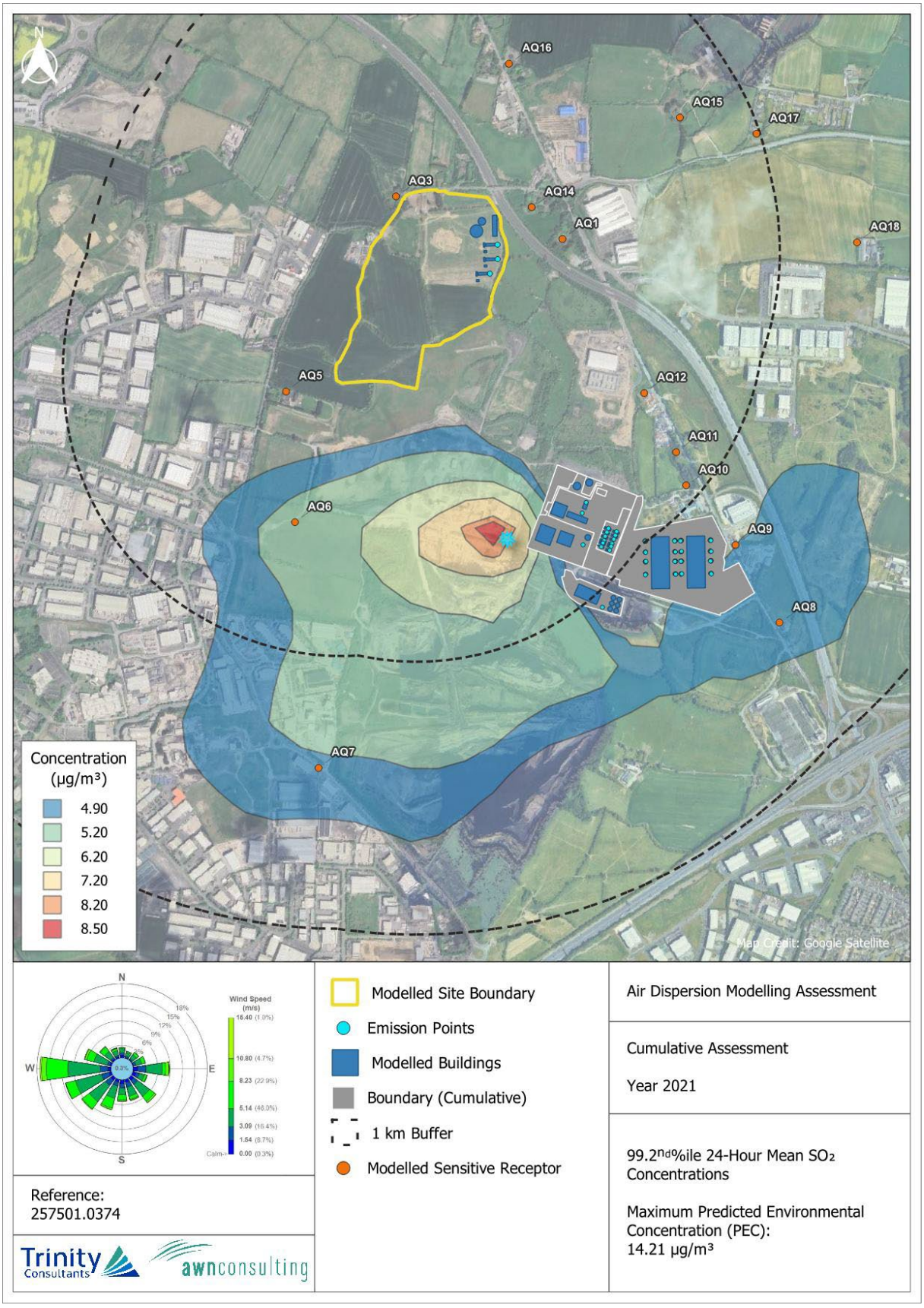


Figure 8.23 Cumulative Assessment - Maximum 24-Hour Mean SO_2 Concentrations (as 99.2nd %ile)



8.7.3.2.2 Air Dispersion Modelling Assessment – Ecology

NO_X

The NO_X modelling results for ecological receptors under the Cumulative Assessment scenario are detailed in Table 8.42 and Table 8.43.

Within the most impacted European site (in terms of PEC) (South Dublin Bay and River Tolka Estuary SPA), at the worst-case location, cumulative emissions lead to a maximum ambient NO_X concentration (including background) which is at most 64% of the annual limit value site over the five years of meteorological data modelled.

Table 8.42. Cumulative Assessment – NO_X Designated Habitat Dispersion Model Results

Ecological Receptor	NO_X Process Contributions (µg/m³)					Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024	X	Y
Malahide Estuary SAC	0.33	0.32	0.34	0.37	0.33	686062	5927441
Malahide Estuary SPA	0.33	0.32	0.34	0.37	0.33	685959	5927443
South Dublin Bay and River Tolka Estuary SPA	0.18	0.18	0.17	0.17	0.19	685158	5916132

Table 8.43. Cumulative Assessment – NO_X Designated Habitat Dispersion Model Results (continued)

Ecological Receptor	Max. PC (µg/m³)	Critical Level (µg/m³)	Max PC % of Critical Level	Further assessment?	Back-ground (µg/m³)	PEC (µg/m³)	PEC % of critical level
Malahide Estuary SAC	0.37	30	1.2%	Yes	12.80	13.17	44%
Malahide Estuary SPA	0.37	30	1.2%	Yes	12.80	13.17	44%
South Dublin Bay and River Tolka Estuary SPA	0.19	30	0.6%	yes	18.90	19.09	64%

SO_2

The SO_2 modelling results for ecological receptors under the Cumulative Assessment scenario are detailed in Table 8.44 and Table 8.45.

Within the most impacted European site (in terms of PEC) (Malahide Estuary SAC and Malahide Estuary SPA), at the worst-case location, cumulative emissions lead to a maximum ambient SO_2 concentration (including background) which is at most 14% of the annual limit value site over the five years of meteorological data modelled.

The effect of sulphur dioxide (SO_2) emissions from the facility on sensitive ecological receptors is therefore considered to be ***direct, long-term, negative,*** and ***not significant***.

Table 8.44. Cumulative Assessment – SO_2 Designated Habitat Dispersion Model Results

Ecological Receptor	SO_2 Process Contributions (µg/m³)					Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024	X	Y
Malahide Estuary SAC	0.018	0.016	0.017	0.018	0.017	686062	5927441
Malahide Estuary SPA	0.018	0.016	0.017	0.018	0.017	685959	5927443
South Dublin Bay and River Tolka Estuary SPA	0.009	0.010	0.009	0.009	0.010	685158	5916132

Table 8.45. Cumulative Assessment – SO_2 Designated Habitat Dispersion Model Results (continued)

Ecological Receptor	Max. PC (µg/m³)	Critical Level (µg/m³)	Max PC % of Critical Level	Further assessment?	Back-ground (µg/m³)	PEC (µg/m³)	PEC % of critical level
Malahide Estuary SAC	0.02	20	0.1%	n/a	0.900	0.918	5%
Malahide Estuary SPA	0.02	20	0.1%	n/a	0.900	0.918	5%
South Dublin Bay and River Tolka Estuary SPA	0.01	20	0.1%	n/a	2.800	2.810	14%

Nitrogen Deposition

In order to consider the effects of nitrogen deposition (as N) owing to emissions from the cumulative emissions on the ecological receptors, the maximum annual mean NO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then nitrogen deposition fluxes (as described in Section 13.2.4.2.5) and shown in Table 8.46 and Table 8.47.

Within the most impacted European site (South Dublin Bay and River Tolka Estuary SPA, in terms of PEC), at the worst-case location, the maximum nitrogen deposition level is 6.325 kgN/ha/yr. This is within the critical load range of 5-10 kgN/ha/yr but above the lowest critical load of 5 kgN/ha/yr for the most sensitive features *Sterna dougallii (Europe - breeding), Sterna hirundo (Northern/Eastern Europe - breeding)* and *Sterna paradisaea (Arctic - breeding/Southern Oceans - wintering))*.

Additionally, the maximum NO_2 process contributions from the facility, from which nitrogen deposition levels are derived, are below the limit of detection of 0.5 ug/m³ which must be achieved by chemiluminescence-based automated NO_X/NO_2 analysers (EN 14211). Limit of detection is defined as the smallest concentration that can be reliably measured by an analytical procedure. The EPA guidelines (EPA, 2022) define an imperceptible effect as *"an effect capable of measurement but without significant consequences"*. NO_2 process contributions, and by extension nitrogen deposition levels, that are below a monitoring instrument's limit of detection are not measurable and will therefore have a less than imperceptible effect.

Table 8.46 Cumulative Assessment – Nitrogen Deposition Dispersion Model Results at Ecological Receptors

Ecological Receptor	NO_2 Process Contributions (µg/m³)					NO_2 Dry Deposition (µg/m²/s)	NO_2 Nitrogen Deposition (kg/ha/yr)
	2020	2021	2022	2023	2024		
Malahide Estuary SAC	0.30	0.29	0.31	0.33	0.30	0.0005	0.048
Malahide Estuary SPA	0.30	0.29	0.31	0.33	0.30	0.0005	0.048
South Dublin Bay and River Tolka Estuary SPA	0.16	0.16	0.15	0.15	0.17	0.0003	0.025

Table 8.47 Cumulative Assessment – Nitrogen Deposition Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	Total PC Nitrogen Dep. kgN/ha /yr)	Assessment critical load (kgN/ha /yr)	PC % of critical load	Further assessment?	APIS Background Nitrogen Dep. (kgN/ha /yr)	Total PEC Nitrogen Dep. (kgN/ha /yr)	Location of max. PC (UTM Zone 29 N)	
							X	Y
Malahide Estuary SAC	0.048	5.0	1.0%	n/a	5.600	5.648	520931	5833535
Malahide Estuary SPA	0.048	7.5	0.6%	n/a	5.600	5.648	520951	5820865
South Dublin Bay and River Tolka Estuary SPA	0.025	5.0	0.5%	n/a	6.300	6.325	520931	5833535

Acid Deposition (as N)

In order to consider the effects of acid deposition (as N) owing to emissions from cumulative emissions on the ecological receptors, the maximum annual mean NO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then acid deposition fluxes (as described in Section 13.2.4.2.5) and shown in Table 8.48 and Table 8.49.

Within the most impacted European site (Malahide Estuary SPA, in terms of PEC), at the worst-case location, the maximum acid deposition (as N) level is 0.503 keq/ha/yr. This is below the lowest assessment criteria critical load of 0.714 keq/ha/yr for the most sensitive feature *Podiceps cristatus (North-western Europe - wintering)*.

Table 8.48 Cumulative Assessment – Acid Deposition (as N) Dispersion Model Results at Ecological Receptors

Ecological Receptor	NO_2 Process Contributions (µg/m³)					NO_2 Dry Deposition (µg/m²/s)	NO_2 Acid Deposition (N) (keq/ha/yr)	Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024			X	Y
Natura 2000									
Malahide Estuary SAC	0.30	0.29	0.31	0.33	0.30	0.0005	0.003	520931	5833535
Malahide Estuary SPA	0.30	0.29	0.31	0.33	0.30	0.0005	0.003	520951	5820865

Ecological Receptor	NO_2 Process Contributions (µg/m³)					NO_2 Dry Deposition (µg/m²/s)	NO_2 Acid Deposition (N) (keq/ha/yr)	Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024			X	Y
South Dublin Bay and River Tolka Estuary SPA	0.16	0.16	0.15	0.15	0.17	0.0003	0.002	520931	5833535

Table 8.49 Cumulative Assessment – Acid Deposition (as N) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	PC Acid Dep. (N) (keq/ ha/yr)	Critical load (MinCL minN) for PC (keq/ ha/yr)	PC % of critical load	Considered for further assessment?	APIS Back-ground Acid Dep. (keq/ ha/yr)	Total PEC Acid Dep. (N) (keq/ ha/yr)	Critical load (MaxCL minN) for PEC (keq/ ha/yr)
Natura 2000							
Malahide Estuary SAC	0.0034	0.143	2.4%	n/a	0.400	0.403	0.714
Malahide Estuary SPA	0.0034	0.143	2.4%	n/a	0.500	0.503	0.714
South Dublin Bay and River Tolka Estuary SPA	0.0018	0.143	1.2%	n/a	0.400	0.402	0.714

Acid Deposition (as S)

In order to consider the effects of acid deposition (as S) owing to emissions from the facility on ecological habitat sites, the maximum annual mean SO_2 process contribution concentrations (PC) are converted into the dry deposition fluxes and then acid deposition fluxes (as described in Section 8.4.2.3).

Within the most impacted European site (Malahide Estuary SPA, in terms of PEC), at the worst-case location, the maximum acid deposition (as S) level is 0.502 keq/ha/yr. This is below the lowest assessment criteria critical load of 4.117 keq/ha/yr for the most sensitive feature *Podiceps cristatus (North-western Europe - wintering)*.

Table 8.50 Cumulative Assessment – Acid Deposition (as S) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	SO_2 Process Contributions (µg/m³)					SO_2 Dry Deposition (µg/m²/s)	SO_2 Acid Deposition (as S) (keq/ha/yr)	Location of max. PC (UTM Zone 29 N)	
	2020	2021	2022	2023	2024			X	Y
Natura 2000									
Malahide Estuary SAC	0.018	0.016	0.017	0.018	0.017	0.0002	0.002	520931	5833535
Malahide Estuary SPA	0.018	0.016	0.017	0.018	0.017	0.0002	0.002	520951	5820865
South Dublin Bay and River Tolka Estuary SPA	0.009	0.010	0.009	0.009	0.010	0.0001	0.001	520931	5833535

Table 8.51 Cumulative Assessment – Acid Deposition (as S) Dispersion Model Results at Ecological Receptors (continued)

Ecological Receptor	PC Acid Dep. (S) (keq/ha/yr)	Critical load (MinCL maxS) (keq/ha/yr)	PC % of critical load	Considered for further assessment?	APIS Back-ground Acid Dep. (keq/ha/yr)	Total PEC Acid Dep. (S) (keq/ha/yr)
Natura 2000						
Malahide Estuary SAC	0.002	4.117	0.1%	No	0.400	0.402
Malahide Estuary SPA	0.002	4.117	0.1%	No	0.500	0.502
South Dublin Bay and River Tolka Estuary SPA	0.001	4.099	0.03%	No	0.400	0.401

8.7.4 Summary

The following table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 8.52 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of construction dust from construction and trackout in terms of dust soiling, and human health	Negative	Slight	Study area as per Section 8.5.3.1.	Likely	Short-term	Direct

The following table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 8.53 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of operational phase process emissions from proposed facility on air quality	Negative	Not significant	Dispersion model study area as per Section 8.5.3.2.1.	Likely	Long-term	Direct

8.8 Mitigation Measures

8.8.1 Construction Phase

The proposed development has been assessed as having a low risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of construction and trackout activities (see Section 8.7.1.1).

Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a low risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Table 8-54 Standard Construction Dust Management Measures

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
Communications	Construction Compound/Site Boundary and throughout (as required)	► An Environmental Manager (EM) will be in assigned by the appointed contractor. The EM will be responsible for co-ordinating the day-to-day management of environmental impacts during the Construction Phase. The EM will be responsible for performing inspections as deemed necessary and manage responses to environmental incidents. The name and contact details of the EM will be responsible for construction dust management and air quality issues will be displayed at the construction compound/site boundary hoarding, as well as head/regional office contact details. ► Any exceptional incidents that cause dust and/or air emissions, either on- or off-site, will be recorded situation in a log book as well as the action taken to resolve them. ► A complaints register will be kept by the appointed contractor 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. ► The complaints log will be made available to the local authority when asked.
Construction Works Area Management	Construction Compound/Site Boundary and throughout (as required)	► Construction compounds will be laid out so that machinery and dust causing activities such as stockpiles are located away from receptors, as far as is practicable. ► The appointed contractor will provide a site hoarding of 2.4m height along site works boundaries, at a minimum, at the any construction compounds, which will assist in minimising the potential for dust impacts off-site. Construction works area fencing, barriers and scaffolding will be kept clean using wet methods. ► Stockpiles will be covered to prevent wind whipping. ► Any chutes and conveyors will be enclosed and skips will be covered. ► Drop heights from any conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised. Fine water sprays will be used on such equipment where visible dust plumes are generated. ► Cutting, grinding or sawing equipment will be fitted with or used in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
		► Equipment will be readily available in the construction works areas site to clean any dry spillages. Spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods. ► An adequate water supply for effective dust or particulate matter suppression and mitigation will be ensured, and non-potable water will be used where possible and appropriate. ► Construction works area runoff of water or mud will be managed as per the Surface Water Management Plan.
Operating Vehicles / Machinery	Construction Compound/Site Boundary and throughout (as required)	► Engines of all vehicles will be switched off engines when stationary - idling vehicles are not permitted. ► The use of diesel- or petrol-powered generators will be avoided and mains electricity or battery powered equipment will be used where practicable.
Earthworks Activities	Areas where earthworks are required	► Materials with the potential to produce dust, such as excavated material, will be removed from the construction works area as soon as possible, unless being re-used within the construction works area. Management of extracted material is detailed in the Construction and Demolition Resource and Waste Management Plan.
Construction Activities	Areas where construction is required	► Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process.
Measures specific to trackout (transport of dust and dirt from the construction works areas onto the public road network)	Construction Compound/Site Boundary and throughout (as required)	► A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles. ► Vehicles transporting loose materials (e.g. spoil or sand) entering and leaving the construction works areas and construction compounds will be covered with tarpaulin to prevent escape of materials during transport. Before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place. ► Where construction work area or construction compound conditions result in large amounts of mud building up on truck wheels, wheel washing will be carried out for trucks before they use the public road network. ► Water-assisted dust sweeper(s) will be used at the access points to a construction compound and the immediate adjoining local road, to remove, as necessary, any material tracked out of the compound.
Monitoring	Construction Compound/Site Boundary and throughout (as required)	► To determine if any short-term dust impacts will occur, a minimum of daily visual inspections for dust soiling of receptors (including roads, and surfaces such as street furniture, cars and windowsills) adjoining the construction works areas will be undertaken. Inspection results will be recorded in the site inspection log. Cleaning will be provided if necessary, such as in the event of a dust complaint resulting from the Proposed Scheme construction works. ► The potential for dust generation increases when rainfall is less than 0.2 mm/day and at wind speeds of greater than 10 m/s. To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as 12 hour rainfall radar showing anticipated amounts of precipitation in mm. ► The frequency of site inspections by the EM responsible for dust management will be increased to a minimum of twice daily during the above conditions. The effectiveness of dust control methods will be monitored via visual inspections and work that would generate dust (e.g. moving materials from stockpiles, or transferring loose dry materials from trucks) will be limited in so far as is practicable during these weather conditions.

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
		► Site inspection results will be recorded the inspection log will be made available to the local authority when asked.

8.8.2 Operational Phase

No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.

8.9 Monitoring

8.9.1 Construction Phase

The assessment of impacts on air quality as a result of the construction phase of the proposed development are predicted to be not significant in EIA terms. Monitoring in the form of visual inspections for nuisance dust has been outlined in Section 8.8.1. Based on the predicted impacts it is concluded that no additional specific monitoring is required.

8.9.2 Operational Phase

The permitted development is regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01, which sets out limits and monitoring requirements for air emissions from the Kilshane site. It is anticipated that a licence review will be required to reflect the design changes at the site resulting from the proposed development. The additional turbines will be subject to the same monitoring requirements already in place for the permitted turbine, licenced under P1208-01.

8.10 Residual Effects of the Proposed Development

8.10.1 Construction Phase

To minimise dust emissions during construction, a series of mitigation measures have been prepared as outlined in Section 13.8. Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are ***short-term, direct, negative, localised*** and ***not significant***.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive 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 will ensure that the impact complies with all EU ambient air quality legislative limit values (set out in Directive 2008/50/EC), which are based on the protection of human health (Table 13-1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is ***short-term, direct, negative, localised*** and ***not significant***.

8.10.2 Operational Phase

Detailed air dispersion modelling of emissions from the proposed development determined that pollutant concentrations will be in compliance with the relevant limit values set out in Table 13-1. Therefore, emissions from the proposed development will have a ***direct, long-term, negative*** and ***not significant*** impact on air quality.

8.10.3 Summary of Post-mitigation Effects

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 8.55 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of construction dust from construction and trackout in terms of dust soiling, and human health	Negative	Not significant	Study area as per Section 8.5.3.1	Likely	Short-term	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 8.56 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of operational phase emissions from facility on air quality	Negative	Not significant	Dispersion model study area as per Section 8.5.3.2.1.	Likely	Long-term	Direct

8.10.4 Cumulative Residual Effects

There is the potential for cumulative impacts to air quality should the construction phase of the proposed development coincide with that of other developments within 500m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken and relevant developments with the potential for cumulative impacts were identified.

There is at most a low risk of dust impacts associated with the proposed development. The dust mitigation measures outlined in Section 8.8 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 cumulative developments are deemed ***direct, short-term, localised, negative*** and ***not significant.***

Detailed air dispersion modelling of cumulative emissions from the proposed development and neighbouring facilities determined that pollutant concentrations will be in compliance with the relevant limit values. Therefore, emissions from the proposed development will have a ***direct, long-term, negative*** and ***not significant*** effect on air quality.

8.11 References

- Air Pollution Information System (2025) GIS map tool https://www.apis.ac.uk/app.
- Alaska Department of Environmental Conservation (ADEC) (2008) ADEC Guidance re AERMET Geometric Means (http://dec.alaska.gov/air/ap/modeling.htm)
- BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites
- Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment
- Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
- Dublin City Council (DCC) (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition
- Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- Environmental Protection Agency (EPA) (2020) Air Dispersion Modelling from Industrial proposed developments Guidance Note (AG4)
- N Environmental Protection Agency (EPA) (2021) Nitrogen–Sulfur Critical Loads: Assessment of the Impacts of Air Pollution on Habitats
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (EPA) (2024a) Ireland's Air Pollutant Emissions 2022 (1990-2030)
- Environmental Protection Agency (EPA) (2024b) Licence Application Instruction Note 2 (IN2) (DRAFT) Assessing the Impact of Ammonia Emissions to Air and Nitrogen Deposition from EPA licensable activities on European Sites)
- Environmental Protection Agency (EPA) (2025a) Air Quality Monitoring Report 2024 (& previous reports)
- Environmental Protection Agency (EPA) (2025b) Air Quality Monitoring website. Available online at: https://airquality.ie/readings
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Government of Ireland (2023) Clean Air Strategy for Ireland
- Hanrahan, P (1999a) The Plume Volume Molar Ratio Method for Determining NO_2/NO_X Ratios in Modelling – Part 1: Methodology J. Air & Waste Management Assoc. 49 1324-1331.
- Hanrahan, P (1999b) The Plume Volume Molar Ratio Method for Determining NO_2/NO_X Ratios in Modelling – Part 21: Evaluation Studies J. Air & Waste Management Assoc. 49 1332-1338.
- Institute of Air Quality Management (IAQM) (2020) A Guide to The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)
- Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)
- Met Éireann (2025) Met Éireann website: https://www.met.ie/
- National Parks and Wilflife Service (NPWS) (2025) NPWS Designations Viewer. Availabe online at: https://experience.arcgis.com/experience/edf34d92e28040fd87d3d14f55d8d95f
- Paine, R & Lew, F. (1997a) "Consequence Analysis for Adoption of PRIME: an Advanced Building Downwash Model" Prepared for the EPRI, ENSR Document No. 2460-026-450.
- Paine, R & Lew, F. (1997b) "Results of the Independent Evaluation of ISCST3 and ISC-PRIME" Prepared for the EPRI, ENSR Document No. 2460-026-3527-02.
- Schulman, L.L; Strimaitis, D.G.; Scire, J.S. (2000) Development and evaluation of the PRIME plume rise and building downwash model. Journal of the Air & Waste Management Association, 50, 378-390.
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

- Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- UK Environment Agency (2014) AGTAG06 – Technical Guidance on Detailed Modelling Approach For An Appropriate Assessment for Emissions To Air
- UK Environment Agency (2025) Air emissions risk assessment for your environmental permit. Available online at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas
- UK Office of Deputy Prime Minister (ODPM) (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- United Nations Economic Commission for Europe (UNECE) (2003) Critical Loads for Nitrogen Expert Workshop 2002
- US Environmental Protection Agency (USEPA) (1985) Good Engineering Practice Stack Height (Technical Support Document For The Stack Height Regulations) (Revised)
- US Environmental Protection Agency (USEPA) (1995) User's Guide for the Industrial Source Complex (ISC3) Dispersion Model Vol I & II
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
- US Environmental Protection Agency (USEPA) (1998) Human Health Risk Assessment Protocol, Chapter 3: Air Dispersion and Deposition Modelling, Region 6 Centre for Combustion Science and Engineering
- US Environmental Protection Agency (USEPA) (1999) Comparison of Regulatory Design Concentrations: AERMOD vs. ISCST3 vs. CTDM PLUS
- US Environmental Protection Agency (USEPA) (2000) Seventh Conference on Air Quality Modelling (June 2000) Vol I & II
- US Environmental Protection Agency (USEPA) (2005) Guidelines on Air Quality Models, Appendix W to Part 51, 40 CFR Ch.1
- US Environmental Protection Agency (USEPA) (2008) AERSURFACE User's Guide
- US Environmental Protection Agency (USEPA) (2011) Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard
- US Environmental Protection Agency (USEPA) (2017) AERMAP Users Guide
- US Environmental Protection Agency (USEPA) (2018) User's Guide to the AERMOD Meteorological Preprocessor (AERMET)
- US Environmental Protection Agency (USEPA) (2022) AERMOD Description of Model Formulation and Evaluation
- World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)
- World Health Organisation (2021) Air Quality Guidelines 2021

Chapter 9 – Climate

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9. CLIMATE

9.1 Introduction

This chapter assesses the likely climate impacts associated with the construction of the two additional gas turbines, hereafter collectively referred to as the Proposed Development, and the impact of climate change on the Proposed Development located at Kilshane Road, Kilshane, Finglas, Dublin 11. A full description of the development is available in Chapter 2 – Description of the Proposed Development.

Kilshane Energy is applying for the construction of two additional gas turbines with an output of 680 Megawatts (MW) to the already permitted Gas Turbine Power Generation Station at the same location. The Proposed Development will be a continuation of the permitted development of reference FW22A/0204, not yet in construction, which will comprise the a Gas Turbine Power Generation Station.

The permitted development is regulated by an existing EPA Industrial Emissions (IE) Licence reference P1208-01, which sets out limits and monitoring requirements for noise, air, water, and foul emissions from the Kilshane site. It is anticipated that a licence review will be required to reflect the design changes at the site resulting from the Proposed Development. The Proposed Development will operate within the licensed emission limits for the Kilshane site, and that no environmental exceedances are expected to occur as a result of the additional turbines.

An overview of the methodology undertaken for the climate impact assessment is outlined below:

- A detailed baseline review of GHG emissions has been undertaken in order to characterise the baseline environment. This has been undertaken through a review of available published GHG emission data;
- A review of the most applicable guidelines for the assessment of GHG emissions has been carried out in order to define the significance criteria for the construction and operational phases of the Proposed Development. These guidelines describe appropriate methods for quantifying the emissions of GHGs from the Proposed Development;
- Predictive calculations and impact assessments relating to the likely impact of the Proposed Development on climate (GHG emissions) have been undertaken;
- An assessment of the vulnerability of the Proposed Development to climate change has been undertaken; and
- A schedule of mitigation measures has been incorporated where required to reduce, where necessary, the identified potential climatic impacts associated with the Proposed Development.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies appropriate adaptation and mitigation measures to increase project resilience.

9.2 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive

understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

9.2.1 Construction Phase

During the construction phase, engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO_2 and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

9.2.2 Operational Phase

Engine emissions from vehicles accessing the site and energy use during operation have the potential to impact climate during the operational phase of the development through the release of CO_2. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the Proposed Development in relation to future climate change must be considered during the operational phase. The Proposed Development has been designed to minimise the impact on climate where possible in reference to measures within the Climate Action Plan 2025 (DECC, 2025).

9.3 Methodology

9.3.1 Relevant Guidance, Legislation & Policy

9.3.1.1 Guidance

The climate assessment has been carried out in line with the guidance outlined in the European Commission publications *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (EC, 2013) and *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report* (EC, 2017) and the EPA publication *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022).

The assessment has referred to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Government of Ireland (2024a) Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027)
- Government of Ireland (2024b) Long-Term Strategy on Greenhouse Gas Emissions Reductions
- Government of Ireland (2024c) National Adaptation Framework 2024
- Government of Ireland (2024d) National Biomethane Strategy
- Government of Ireland (2023b) National Hydrogen Strategy
- Government of Ireland (2025) 2025 Climate Action Plan
- Institute of Sustainability & Environmental Professionals (ISEP) (formerly known as IEMA) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEP GHG guidance) (ISEP, 2022);
- ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP Climate Change guidance) (ISEP, 2020a);
- ISEP GHG Management Hierarchy (hereafter referred to as the ISEP GHG Management Hierarchy) (ISEP, 2020b);
- ISEP Principles Series: Climate Change Mitigation & EIA (ISEP, 2010);
- Publicly Available Specification (PAS) 2080:2016 on Carbon Management in Infrastructure (BSI, 2016);

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a);
- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a); and
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2024a).

9.3.1.2 Legislation

9.3.1.2.1 International Legislation & Policy

The Paris Agreement (UNFCCC, 2015), 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 (degrees Celsius) above pre-industrial levels with efforts to limit this rise to 1.5°C. Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs comprise the efforts and actions by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each country to prepare the NDCs that it intends to achieve, updating and enhancing the NDCs every 5 years. Countries are required to implement mitigation measures, with the aim of achieving the objectives of such contributions. Each of the EU Member States submit their own NDCs, which contribute to the overall EU NDC.

The European Green Deal, published by the European Commission in December 2019, provides an action plan which aims for the EU to be climate neutral by 2050. The EU Green Deal highlights that further decarbonisation of the energy sector is critical to reach climate objectives in 2030 and 2050. The European Green Deal has increased the GHG emissions reduction 2030 target to at least 55% in comparison to 1990 levels.

On 14 July 2021, the European Commission adopted a series of legislative proposals setting out how it intends to achieve climate neutrality in the EU by 2050, including the intermediate target of at least a 55% net reduction in greenhouse gas emissions by 2030. The package of proposals is known as the 'Fit for 55' package.

The package includes revisions to the legislation put forward as part of the Climate and Energy Framework 2021-2030, including the EU Emissions Trading System (ETS), Effort Sharing Regulation, transport and land use legislation, setting out in real terms the ways in which the Commission intends to reach EU climate targets under the European Green Deal.

The EU ETS was launched in 2005 as the world's first international company- level 'cap-and trade' system for reducing emissions of greenhouse gases cost-effectively. The EU ETS regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry.

Under this new package of legislative proposals, the sectors of the Irish economy covered by the current ETS must reduce emissions by 42% by 2030 compared to 2005 levels by increasing annual emissions reduction to 4.2% per annum.

The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture. These sectors must reduce emissions by 42% by 2030 compared to 2005 levels.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate

target of reducing net greenhouse gas (GHG) emissions by at least 55% by 2030, compared to 1990 levels.

The 2021 EU Strategy on Adaptation to Climate Change sets out the pathway to prepare for the unavoidable impacts of climate change. The aim is that "*by 2050, when we aim to have reached climate neutrality, we will have reinforced adaptive capacity and minimised vulnerability to climate impacts…"* Adaptation refers to measures that can reduce the negative impact of climate change by, for example, ensuring a project is resilient to future increases in storm frequency and rainfall levels.

The EU has adopted integrated monitoring and reporting rules to ensure progress towards its 2030 climate and energy targets and its international commitments under the 2015 Paris Agreement.

Climate is also addressed specifically in Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Recital (7) of Directive 2014/52/EU states that:

"*Over the last decade, environmental issues, such as resource efficiency and sustainability, biodiversity protection, climate change, and risks of accidents and disasters, have become more important in policy making. They should therefore also constitute important elements in assessment and decision-making processes*".

Recital (13) of Directive 2014/52/EU states that:

"*Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change*".

Additionally Annex IV requires the following to be considered within Environmental Impact Assessment:

- *Paragraph 4: "A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape".*
- *Paragraph 5 (f): "A description of the likely significant effects of the project on the environment resulting from, inter alia: the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".*

9.3.1.2.2 National Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015, as amended (the 2015 Act) (Government of Ireland, 2015) was enacted. The purpose of the 2015 Act is to enable Ireland "*so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy (in this Act referred to as the "national climate objective")"* (3.(1) of No. 46 of 2015). The 2015 Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the 2015 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, 2019). 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 fifth and most recent climate action plan, CAP25, was published in April 2025 (Government of Ireland, 2025).

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 in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act), in March 2021, which amended the 2015 Act. The 2021 Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021) 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 also provides 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*".

In relation to carbon budgets, the 2015 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 9.1. 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 Climate, Environment and Energy (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 sectorial emission ceilings for 2030 are published in CAP25 and are shown in Table 9.2. Electricity has a 75% reduction requirement and a 2030 emission ceiling of 3 Mt CO_2e (carbon dioxide equivalent).

Table 9.1 Ireland's 5-Year Carbon Budgets

Period	Mt CO_2e	Emission Reduction Target
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 9.2 Sectoral Emission Ceiling 2030

Sector	Baseline (Mt CO_2e)	Carbon Budgets (Mt CO_2e)		2030 Emissions (Mt CO_2e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50

Sector	Baseline (Mt CO_2e)	Carbon Budgets (Mt CO_2e)		2030 Emissions (Mt CO_2e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, a new approach aligned with the EU LULCCF Regulation has been adopted.			
Total	**68**				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	**-**	**295**	**200**	**-**	**51**

9.3.1.3 Policy

9.3.1.3.1 Greenhouse Gas Policy

National Policy

In December 2023, CAP24 was published, establishing key actions to deliver a 51% reduction in GHG emissions by 2030 (compared to 2018 levels) and achieve climate neutrality by 2050 (DECC, 2023a). The updated and current CAP25, published in April 2025, builds on the progress of the previous four iterations of the CAP, with CAP23 first publishing carbon budgets and sectoral emission ceilings. It also reaffirms Ireland's climate ambition, with a focus on delivery, implementation and measurable outcomes, particularly ahead of the second carbon budget period (2026–2030). 2025 is the last year in the first 5-year carbon budget period. During the initial 5-year budget period the average annual reduction required was 4.8%, this increases to 8.3% in the second budget period (2026-2030). CAP25 retains the high-impact sectors where the biggest savings can be achieved, while emphasising public sector leadership and green procurement. These sectors include renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and land-use change.

CAP25 also includes targeted actions to decarbonise industrial heat and support the transition to carbon-neutral manufacturing processes. Public sector leadership is strengthened through a new Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027), the development of mandatory Climate Action Roadmaps, and enhanced emissions monitoring and reporting across government operations. To support innovation and ensure future economic resilience, IDA Ireland continues to attract and support businesses investing in climate technologies and low-carbon solutions.

CAP25 highlights a significant 17% reduction in electricity emissions in early 2024, with wind power supplying nearly 40% of Ireland's total electricity demand and over 100,000 rooftop microgenerators connected to the grid. Investments are ongoing in grid reinforcement, offshore wind development, and interconnectors with France and the UK to enhance renewable generation capacity. EirGrid, Enterprise Ireland and IDA Ireland have recently signed an MoU to collectively support offshore wind development in Ireland.

CAP25 also reinforces targets first outlined in CAP24 to reduce the embodied carbon of construction materials, with a 10% reduction by 2025 and 30% reduction by 2030 for materials produced and used in Ireland. Cement and high embodied carbon construction materials can be reduced through product substitution, reduced clinker content in cement and uptake of low-carbon construction methods, including those outlined in the Construction Industry Federation 2021 report Modern Methods of Construction (Construction Industry Federation, 2021). There also remains scope for the construction industry to use more timber in construction. In 2022, 24% of new construction in Ireland was built using timber frames to satisfy the demand for housing. Public bodies are now required under the Public Sector Mandate to use best practice project design to reduce embodied carbon; procure concretes with clinker replacements (lower carbon); and require that large construction projects produce a whole life cycle GHG emissions assessment.

Furthermore, CAP25 advances sector-specific measures in green procurement, electrification of transport and heat, and just transition (with the introduction of a Just Transition Commission) to support vulnerable communities. Transport emissions increased by 0.3%. Electric vehicles and the use of biofuels are stated as the best means of transport emission reductions in the medium term.

CAP25 also includes a key target of "at least 2 GW" of new flexible gas plant, intended to produce a *"more flexible energy system, reducing the strain on the power system, and ensuring that we maximise our renewables potential."* The Proposed Development will provide 0.680 GW of this capacity.

In April 2023, the Government published its *Long-Term Strategy on Greenhouse Gas Emissions Reductions* (Government of Ireland, 2024b). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan.

Local Policy

The Fingal County Council (FCC) Climate Action Plan 2024-2029 (FCC and Codema, 2024) outlines FCC's goals to mitigate GHG emissions and plans to prepare for and adapt to climate change. The FCC Climate Action Plan states that FCC aims to reduce car dependency by encouraging modal shifts from cars to active travel and more sustainable modes, including public transport and cycling. Similar to DECC, FCC states that it wishes to work with the relevant transportation bodies to introduce measures to achieve modal shifts.

9.3.1.3.2 Climate Change Vulnerability Policy

The second National Adaptation Framework (NAF) (DECC, 2024) was published in June 2024 in line the five-year requirement of the 2015 Climate and Low Carbon Development Act. The plan provides a whole of government and society approach to climate adaptation in Ireland to reduce Irelands vulnerability to climate change risks including extreme weather events, flooding, drought, loss of biodiversity, sea level rise and increased temperatures. Like the *"Just Transition"* when considering carbon emissions, the NAF aims for *"Just Resilience"* stating that *"a climate resilient Ireland will have a reduced reliance on fossil fuel; it will have widely accessible electrified public transport and will have transitioned towards sustainable agricultural practices such as agroforestry and organic farming".*

In relation to the built environment the NAF states in Chapter 3 "*deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment*". Within the NAF it mentions that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards (to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms for example) according to the NAF (DECC, 2024).

The National Climate Change Risk Assessment (NCCRA) was published in May 2024 (EPA, 2024a). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to "*further develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland*". The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

- **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected
- **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- **Risk** - the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and the greatest requirement for adaptation.

These scenarios align with a conservative approach to assess risks to Ireland and assumes global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030)
- Medium term (~2050)
- Long term (~2100).

9.3.2 Greenhouse Gas Assessment

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 9.4.1).

9.3.2.1 Construction Phase

The GHG assessment has been conducted following the TII PE-ENV-01104 guidance (TII, 2022a). PE-ENV-01104 (TII, 2022) recommends the calculation of the construction stage GHG emissions, including embodied carbon, using the TII Online Carbon Tool (TII, 2025). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2025) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. However, the tool can be used to estimate the GHG emissions from other development types such as the proposed project as a number of the material types and activities are somewhat similar.

The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland's CAP goal of Net Carbon Zero by 2050.

The TII Online Carbon Tool (TII, 2025) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2025) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080.

The TII Carbon Tool has been used to assess the GHG emissions associated with excavation works, construction materials, material transport, construction worker travel and construction waste for the Proposed Development. Precautionary estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the Proposed Development.

9.3.2.2 Operational Phase

The TII Carbon Tool has also been used to assess the GHG emissions associated with energy usage by the AGI, and the GHG emissions associated with the fuel combusted by the turbine to generate power. The TII Carbon Tool incorporates the most recent figure for carbon intensity of electricity generation in Ireland of 226.3 gCO_2e/kWh (SEAI, 2025), which is applicable to the site's energy import from the grid. The tool also incorporates the carbon intensity of natural gas in Ireland of 203.8 gCO_2e/kWh (SEAI, 2025), which is applicable to the fuel consumption by the 2 no. turbines for power generation.

The Proposed Development operational lifespan (i.e. when the plant has been commissioned and is producing energy) is 25 years. The impact of GHG emissions has been considered for this operational lifespan.

Two operational scenarios have been considered for this assessment. The Expected Emissions Scenario constitutes 100 hours of turbine operation on natural gas per year) and is considered the likely operational scenario. The Maximum Emissions Scenario comprises 24/7, 365 days per year of turbine operation on natural gas. The Proposed Development will need to be available for dispatch to the national grid, as many hours as may be required (up to a maximum of 8,760 hours in a year). Eirgrid as the Transmission System Operator (TSO) will ultimately decide the dispatch of the turbines in response to real time system requirements. This scenario considers the maximum number of hours the gas turbines can operate in a year, and is considered the unlikely operational scenario.

The TII Carbon Tool has also been used to quantify the GHG emissions associated with the vehicle movements of staff and HGV deliveries annually during the operational phase.

9.3.2.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on ISEP GHG Guidance (ISEP, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*'.

The ISEP GHG Guidance (ISEP, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and

- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with ISEP GHG Guidance (ISEP, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".*

Significance is determined using the criteria outlined in Table 9.3 (derived from Table 6.7 of PE-ENV-01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 9.3 GHGA Significance Criteria

Effects	Significance level Description	Description
Significant adverse	Major adverse	► The project's GHG impacts are not mitigated. ► The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and ► No meaningful absolute contribution to Ireland's trajectory towards net zero[1].
	Moderate adverse	► The project's GHG impacts are partially mitigated. ► The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and ► Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	► The project's GHG impacts are mitigated through 'good practice' measures. ► The project has complied with existing and emerging policy requirements; and ► Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	► The project's GHG impacts are mitigated beyond design standards. ► The project has gone well beyond existing and emerging policy requirements; and ► Well 'ahead of the curve' for Ireland's trajectory towards net zero.

[1] Net Zero: "When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period." Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

Effects	Significance level Description	Description
Beneficial	Beneficial	► The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. ► The project has gone well beyond existing and emerging policy requirements; and ► Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the Proposed Development (TII, 2022a). The approach is based on comparing the net Proposed Development GHG emissions to the relevant carbon budgets (Government of Ireland, 2025a). With the publication of the Climate Action Act in 2021 and CAP25, sectoral carbon budgets have been published for comparison with the net GHG emissions from the Proposed Development over its lifespan.

9.3.3 Climate Change Risk Assessment (CCRA)

The assessment involves determining the vulnerability of the Proposed Development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 9.4, future climate change modelling and input from other experts working on the Proposed Development (i.e. hydrologists) should be used to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of Proposed Development assets (i.e. receptors) and their exposure to climate change hazards.

The Proposed Development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.

- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.

- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2**.**

- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken (European Commission, 2021a; TII, 2022a). The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. Current and future climate hazards are discussed in Section 9.4. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.

- **Medium Exposure** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.

- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

9.3.3.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 9.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the Proposed Development is considered not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Table 9.4 CCRA Vulnerability Matrix

		Exposure		
		High (3)	**Medium (2)**	**Low (1)**
Sensitivity	**High (3)**	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening CCRA, detailed in Section 9.5.3.2, did not identify any residual medium or high risks to the Proposed Development due to climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 9.6.1.

9.3.4 Forecasting Methods and Difficulties Encountered

There were no difficulties encountered when undertaking this assessment.

9.4 Receiving Environment

Climate is defined by the IPCC (IPCC, 2023) as the average weather over a period of time, whilst climate change is a significant change to the average weather. Climate change is a natural phenomenon but in the industrial age human activities, through the release of GHGs, have impacted on the climate (EPA, 2025b). The release of anthropogenic GHGs is altering the Earth's atmosphere resulting in a 'Greenhouse Effect'. This effect is causing an increase in the atmosphere's heat trapping abilities resulting in increased average global temperatures over the past number of decades. The release of CO_2 as a result of burning fossil fuels, has been one of the leading factors in the increase of the 'Greenhouse Effect'. The most significant GHGs are CO_2, methane (CH_4) and nitrous oxide (N_2O).

For the purposes of this assessment, the definition outlined in Council Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (hereafter referred to as the Renewable Energy Directive) for GHGs has been used. In Annex V, C. Methodology Point 5 of the Renewable Energy Directive the relevant GHGs are defined as CO_2, CH_4 and N_2O. CO_2 accounted for 61.1% of total GHG emissions in Ireland in 2023 while CH_4 and N_2O accounted for 28.9% and 8.8% respectively. The main source of CH_4 and N_2O is from the agricultural sector.

GHGs have different efficiencies in retaining solar energy in the atmosphere and different lifetimes in the atmosphere. In order to compare different GHGs, emissions are calculated on the basis of their Global Warming Potential (GWPs) over a 100-year period, giving a measure of their relative heating effect in the atmosphere. The IPCC AR6 Synthesis Report: Climate Change 2021 (IPCC, 2023) sets out the global warming potential for a 100-year time period (GWP100) for CO_2 as the basic unit (GWP = 1) whereas CH_4 has a global warming potential equivalent to 29.8 units of CO_2 (for fossil sources) and N_2O has a GWP100 of 273. These values have been refined since the AR5 report.

9.4.1 Current GHG Baseline

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Data published in July 2025 (EPA, 2025a), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (406/2009/EC) by 1.03 Mt CO_2e. However, the 2024 emissions represent the second consecutive year in which Ireland's emission were below (-4.2%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-1.1%) and ESR (Effort Sharing Regulation) emissions decreased (-2.2%). Ireland's target is an emission reduction of 626 kt of CO_2e by 2030 on an average baseline of 2016 to 2018.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 2.0% on 2023 levels to 53.82 Mt CO_2e, with a 0.7 Mt CO_2e (-8.9%) reduction in electricity industries alone. This was driven by a 39.7% share of energy from renewables in 2024 and the complete phase-out of peat for

electricity generation. Manufacturing combustion and industrial processes decreased by 4.6% to 6.0 Mt CO_2e in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 37.9% of the total, followed by transport at 20.8%. For 2024, total national emissions (including LULUCF) were 57.53 Mt CO_2e (EPA, 2025a) (see Table 9.5).

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12.0% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2024 Ireland has used 79% (186 Mt CO_2e) of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025. This leaves 21% of the budget available for 2025, requiring a substantial 17.5% annual emissions reduction for 2025 to stay within budget.

Table 9.5 Trends in National GHG Emissions in 2021 – 2024

Sector [Note 1]	2021 Emissions (Mt CO_2e)	2022 Emissions (Mt CO_2e)	2023 Emissions (Mt CO_2e)	2024 Emissions (Mt CO_2e)	Total Budget (Mt CO_2e) (2021-2025)	% Budget 2021-2025 used	Annual change 2023 to 2024
Electricity	9.89	9.69	7.57	6.95	40	85.25%	-8.19%
Transport	11.09	11.76	11.8	11.65	54	85.74%	-1.27%
Buildings (Residential)	6.87	5.75	5.35	5.61	29	81.31%	4.86%
Buildings (Commercial and Public)	1.44	1.45	1.39	1.49	7	82.43%	7.19%
Industry	7.09	6.62	6.31	6.01	30	86.77%	-4.75%
Agriculture	21.94	21.78	20.72	20.41	106	80.05%	-1.50%
Other [Note 2]	1.86	1.93	1.81	1.63	9	80.33%	-9.94%
LULUCF	4.63	3.98	3.89	3.89	–	–	0
Total including LULUCF	**64.82**	**62.99**	**58.83**	**57.64**	**295**	**82.81%**	**-2.04%**

Note 1 Reproduced from latest emissions data on the EPA website (EPA, 2025a).

Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land (landfilling), solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

9.4.2 Future GHG Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022) and ISEP GHG guidance (ISEP, 2022) the future baseline is a trajectory towards net zero by 2050, *"whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050"*.

The future baseline will be determined by Ireland meeting its targets set out in the CAP25, and future CAPs, alongside binding 2030 and net zero by 2050 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted *'Regulation (EU) 2018/842 on binding annual GHG 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' (hereafter referred to as the Regulation) (European Union, 2018). 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. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

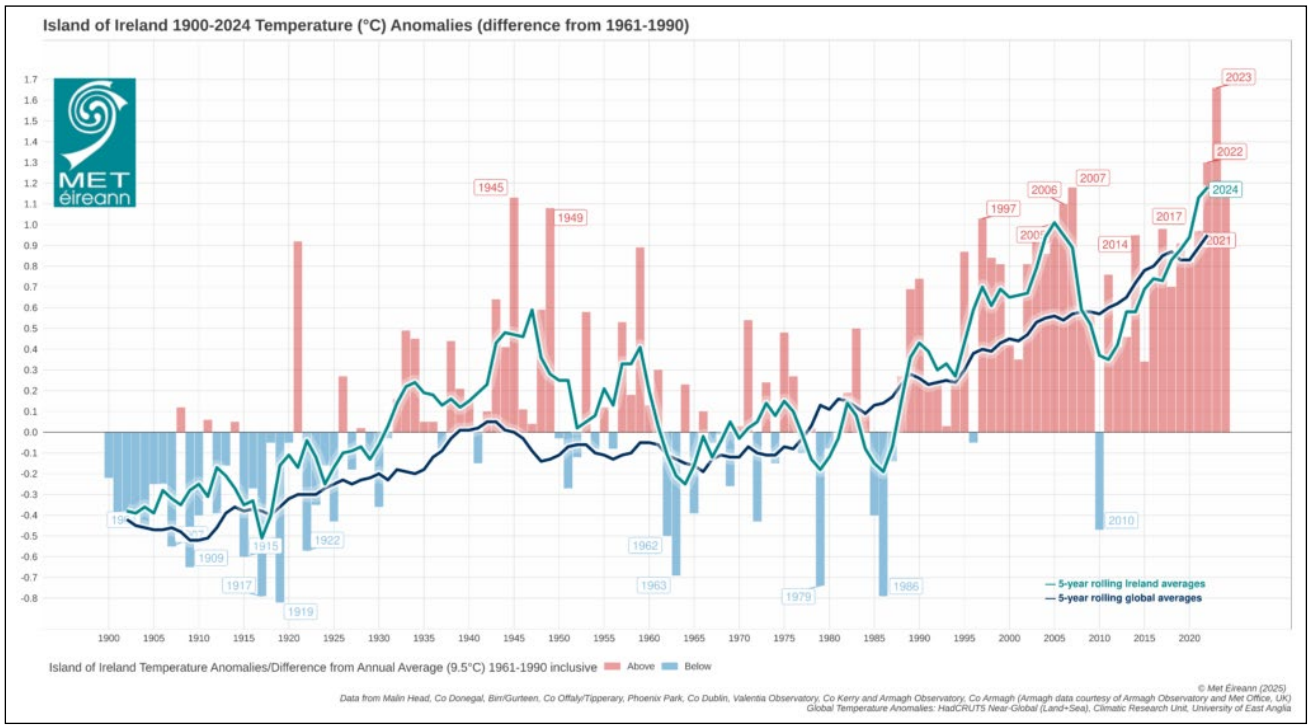
In May 2025, the EPA released the report *Ireland's Greenhouse Gas Emissions Projections 2024-2055* (EPA, 2025b), which includes total projected emissions and a breakdown of projected emissions per sector under the 'With Existing Measures' and 'With Additional Measures' scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

9.4.3 Current CCRA Baseline

The region of the Proposed Development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Casement Aerodrome is the nearest, representative, weather and climate monitoring station to the Proposed Development with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for Casement Aerodrome meteorological station is considered representative of the current climate in the region of the Proposed Development. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Casement Aerodrome meteorological station were October and November, and the driest month on average was March (Met Éireann, 2024b). July was the warmest month with a mean temperature of 19.8 Celsius. January was the coldest month with a mean temperature of 8 Celsius.

Met Éireann's 2024 Climate Statement (Met Éireann, 2025) states 2024's average shaded air temperature in Ireland is provisionally 10.72°C, which is 1.17°C above the 1961-1990 long-term average. This makes 2024 the fourth warmest year on record, 0.49 °C cooler than 2023, the warmest year on record. The majority of annual rainfall totals across the country were below their Long-Term Average 1981-2010. Six stations (Mace Head, Co. Galway, Sherkin Island, Co. Cork, Dunsany, Co. Meath, Gurteen, Co. Tipperary, Athenry, Co. Galway and Finner, Co. Donegal) had their highest mean wind for August on record (record lengths ranging between 13 and 20 years). (see Figure 9.1).

Figure 9.1 1900-2024 Temperature (°C) Temperature Anomalies (differences from 1961-1990)



Recent weather patterns and records of extreme weather events recorded by Met Éireann have been reviewed. Considering the 2024 data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures mean the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

9.4.4 Future CCRA Baseline

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the Proposed Development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the Proposed Development (EPA, 2021b):

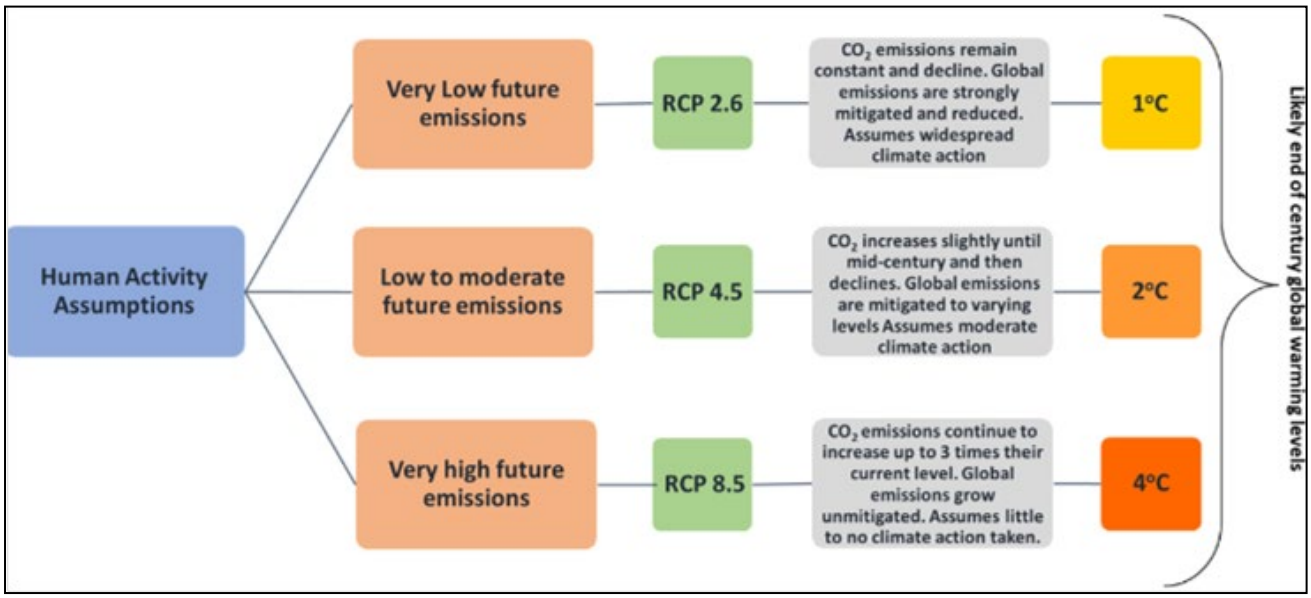
- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

TII's Guidance document PE-ENV-01104 (TII, 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate, while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st

century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

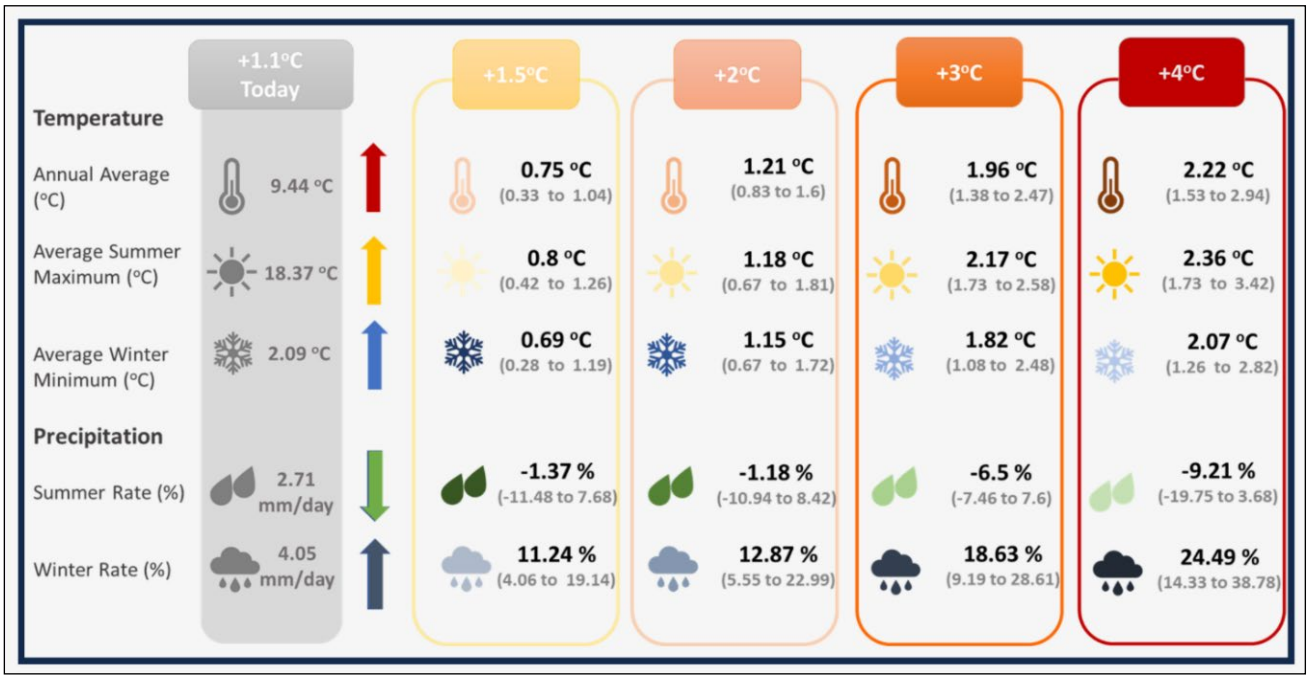
National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2024a) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 9.2.

Figure 9.2 Representative Concentration Pathways associated emission levels - TRANSLATE project storymap (Met Éireann, 2024a)



TRANSLATE (Met Éireann, 2024a) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C. Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SSTs) (Met Éireann, 2024a). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (See Figure 9.3). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

Figure 9.3 Change of climate variables for Ireland for different global warming thresholds - TRANSLATE project storymap (Met Éireann, 2024c)



The TRANSLATE research report (Met Éireann, 2024c) finds that night-time temperatures will warm more than day-time temperatures, with temperatures increases across all seasons but the highest in the summer (with an increase of 0.5°C to 3.5°C). Autumn is projected to have the highest increase in average minimum temperatures (with an increase of 1.1°C to 4.4°C). The variance is dependent on the scenario that is being reviewed. While these temperatures are projected across all of Ireland, they increase most in the east of the country compared to the west. With respect to rainfall, increases of 4% to 38% are projected, however this will not be spread across the year as during summer months there are projected decreases in rainfall beyond the 2°C warming scenario.

In January 2024 the EPA published *Ireland's Climate Change Assessment Synthesis Report* (EPA, 2024e) which contained four volumes:

- Volume 1: Climate Science: Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality by 2050
- Volume 3: Being Prepared for Ireland's Future Climate
- Volume 4: Realising the Benefits of Transition and Transformation

This report reinforces the existing and future risks arising from climate change. Volume 1 (EPA, 2024e) states that under Early action, the temperature increase averaged across the island of Ireland relative to the recent past (1976 to 2005) would reach 0.91°C (0.44 to 1.10°C) by mid-century before falling back to 0.80°C (0.34 to 1.07°C) at the end of the century. Whereas under Late action, by the end of the century it is projected that the temperature increases could be 2.77°C (2.02 to 3.49°C). Heat extremes will become more frequent and more severe and cold extremes will become less frequent and less severe with further warming.

Precipitation was 7% higher over the period 1991 to 2020 than over the 1961 to 1990 period. The average future predicted increase in precipitation is <10% in annual mean accumulated. By 2100 projected additional rises in sea level range from 0.32 to 0.6m under early action to 0.63 to 1.01m under late action scenarios, with greater storm surges potentially effecting critical infrastructure along the coastline.

Projections of changes in storminess are highly uncertain and translate into large uncertainties in future frequency and intensity of extreme waves.

Volume 3 (EPA, 2024e) discusses how water supplies will face growing pressures resulting in increased water demand and how options need to be developed, including potential new sources. The report states the key role of critical infrastructure for delivering public services, economic development and a sustainable environment. These are exposed to a range of climate extremes. Failures in critical infrastructure can cascade across other sectors and present a multi-sector risk due to climate change.

The report references the EPA's *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021a) as the most substantial research project in Ireland to date on climate change and critical infrastructure which assesses the future performance of Ireland's critical infrastructure when climate is considered. The Critical Infrastructure Vulnerability to Climate Change report states with respect to water availability and quality, that flood risk and heatwaves have a medium vulnerability index and the underground supply network has a high vulnerability to snowstorms and cold spells. However, while the vulnerability is high, the exposure is likely to reduce due to future climate change resulting in less cold weather events. The risk assessment highlights the co-dependence of the water sector to the energy sector, and how vulnerability in the energy sector may have cascading impacts.

Volume 4 (EPA, 2024e) calls for system change, including a transformation of urban settings. Stating that meaningful urban transformation can create a better living environment while simultaneously reducing emissions.

9.5 Potential Impacts of the Proposed Development

9.5.1 Do-Nothing Impact

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider are, including influences from potential new developments in the surrounding area, changes in road traffic, etc.

As the site is zoned for development, it is likely that in the absence of the Proposed Development a development of a similar nature would occur in the future. Therefore, the predicted greenhouse gas emissions associated with the construction and operation phases are likely to occur regardless of the specific Proposed Development. Climate change is being driven by broader, long-term global trends in greenhouse gas concentrations, which will continue irrespective of any localised development. This assessment focuses on the contribution of the Proposed Development to the overall emissions and considers mitigation measures to minimise its climate impact.

9.5.2 Greenhouse Gas Assessment

9.5.2.1 Construction Phase

The most significant proportion of GHG emissions tend to occur during the construction phase as a result of embodied carbon in construction materials and GHG emissions from construction activities (see Section 9.5.2.3 and Table 9.6 for details).

The construction phase of the Proposed Development is predicted to result in 2,616 tCO_2e (105 tCO_2e annualised). The GHG assessment has highlighted the areas where the highest GHG emissions occur during the construction phase. Construction worker travel to the results in the majority of GHG emissions for the construction phase of the proposed project, at approximately 71% of the total construction phase GHG emissions. Transport of the construction materials makes the second highest contribution at 24%.

9.5.2.2 Operational Phase

Under the Expected Emissions Scenario (100 hours of turbine operation on natural gas per year), the operational phase of the Proposed Development is predicted to result in 36,989 tCO_2e annually, which accounts for approx. 99% of the total Proposed Development GHG emissions. The majority of GHG emissions associated with the operational phase, and the overall lifespan, of the Proposed Development, originate from the combustion of natural gas by the turbines. This is the likely operational scenario for the Proposed Development.

Under the Maximum Emissions Scenario (24/7, 365 days per year of turbine operation on natural gas), the operational phase of the Proposed Development is predicted to result in 3,078,998 tCO_2e annually, which accounts for approx. 99% of the total Proposed Development GHG emissions. The majority of GHG emissions associated with the operational phase, and the overall lifespan, of the Proposed Development, originate from the combustion of natural gas by the turbines. The Proposed Development will need to be available for dispatch to the national grid, as many hours as may be required (up to a maximum of 8,760 hours in a year). This scenario considers the maximum number of hours the gas turbines can operate in a year, and is considered the unlikely operational scenario.

9.5.2.3 Total GHG Emissions Over Construction and Operational Phases

Figure 9.4, Figure 9.5, and Table 9.6 show the GHG emissions for the Proposed Development per life-cycle stage based on the output from the TII Carbon Tool in both the Expected Emissions Scenario and the Maximum Emissions Scenario (as described in Section 9.3.2.2).

The largest source of GHG emissions from the Proposed Development is from the combustion of natural gas by the 2 no. gas turbines. These sources contribute approx. 99% of the annual GHG emissions from the Proposed Development.

The total annualised GHG emissions for the Proposed Development under the Expected Emissions Scenario (100 hours of turbine operation on natural gas per year) are predicted to be 37,094 tCO_2e. This is the likely operational scenario for the Proposed Development.

The total annualised GHG emissions for the Proposed Development under the Maximum Emissions Scenario (24/7, 365 days per year of turbine operation on natural gas per year) are predicted to be 3,079,103 tCO_2e. The Proposed Development will need to be available for dispatch to the national grid, as many hours as may be required (up to a maximum of 8,760 hours in a year). This scenario considers the maximum number of hours the gas turbines can operate in a year, and is considered the unlikely operational scenario.

Table 9.6 GHG Assessment Results

GHG Assessment Category	Elements Considered	Predicted GHG Emissions (tCO_2e)		Relevant Sector for Carbon Budget Comparison
		Expected Operation Scenario	Maximum Operation Scenario	
Materials	Plastic pipework and cabling, road pavement materials (e.g. asphalt)	92	92	Industry
Material Transport	HGV and LGV trips	638	638	Transport
Excavation	Topsoil, subsoil and other excavation	28	28	Industry
Construction Worker Travel to Site	Car, van and LGV trips	1,858	1,858	Transport
Construction Waste Disposal	Mixed construction waste, concrete, timber, wood, metals and excavated material	3	3	Waste
Construction Waste Transport	Transport of waste offsite. Waste will be taken from the site by HGV. Distance to destination waste management facility estimated at 30 km (per trip) from the	206	206	Transport

GHG Assessment Category	Elements Considered	Predicted GHG Emissions (tCO_2e)		Relevant Sector for Carbon Budget Comparison
		Expected Operation Scenario	Maximum Operation Scenario	
	site.			
Operational Energy	Expected scenario: electricity demand by site buildings (per year) and natural gas use (100 hrs per year) by turbine Maximum scenario: natural gas use (8,760 hrs per year i.e. 24/7, 365 days) by turbine	35,193	3,077,202	Electricity
Operational Transport	Maintenance staff vehicle movements per year	1,796	1,796	Transport
Totals				
	Expected Operation Scenario	**Maximum Operation Scenario**		
Total Construction Phase	2,825 tCO_2e (113 tCO_2e annualised)	2,825 tCO_2e (113 tCO_2e annualised)		
Total Operational Phase	36,989 tCO_2e (annually)	3,078,998 tCO_2e (annually)		
Total Annual GHG Emissions	**37,102 tCO_2e (annually)**	**3,079,111 tCO_2e (annually)**		

Figure 9.4 Annualised GHG Emissions by Life-Cycle Stage

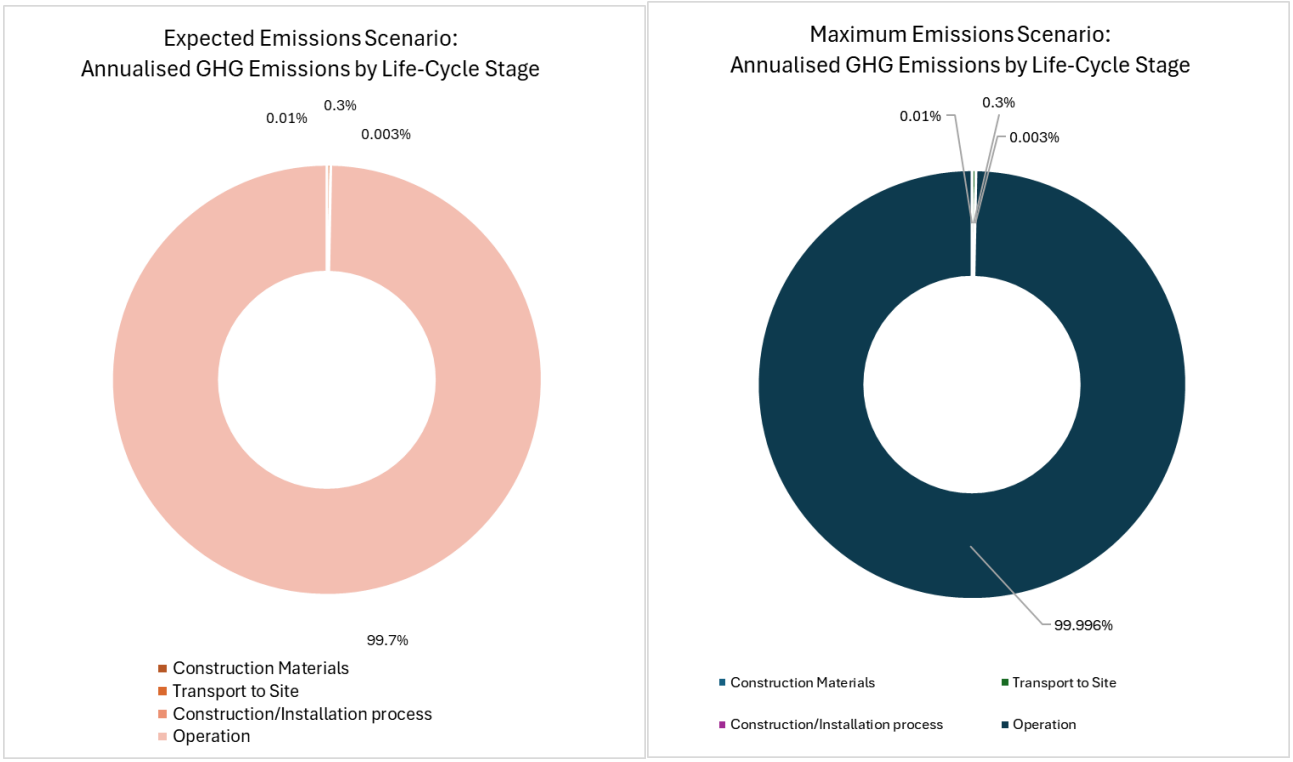
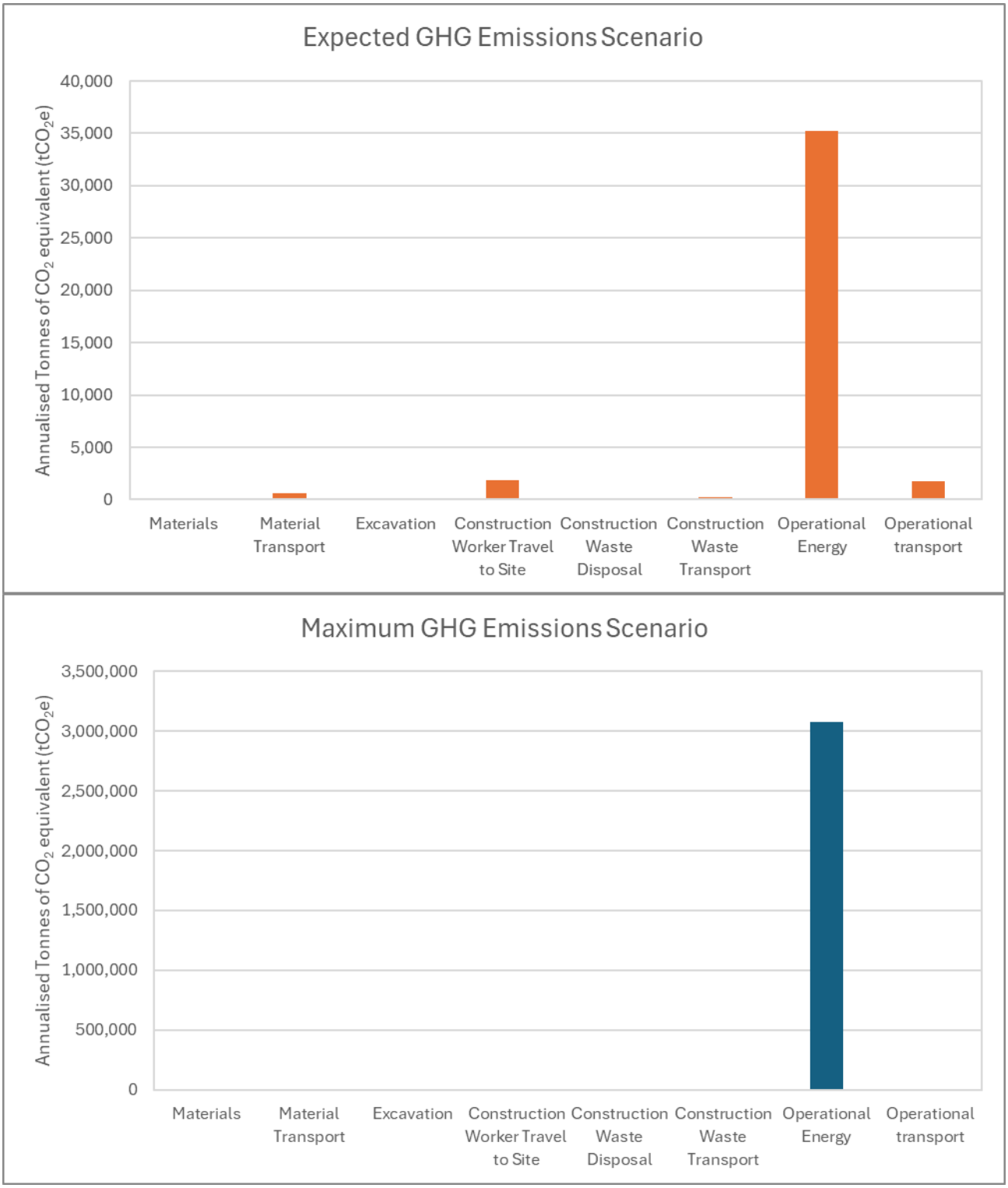


Figure 9.5 Greenhouse Gas Emissions by Activity



The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories, and these must be compared separately to the relevant sectoral emissions budget. The predicted GHG emissions (as shown in Table 9.6) have been averaged over the full lifespan of the Proposed Development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

In Table 9.7, GHG emissions have been compared against the carbon budget for the industry, transport

and waste sectors in 2030 (Government of Ireland, 2025), against Ireland's total GHG emissions in 2024, against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO_2e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council) and against Ireland's EU 2030 target of a 42% reduction in ETS sector emissions based on 2005 levels (12.9 Mt CO_2e) (Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading and amending Council Directive 96/61/EC (as amended)).

In the likely ('Expected') operational scenario, the estimated total GHG emissions, when annualised over the 25-year Proposed Development lifespan, are equivalent to 0.07% of Ireland's total GHG emissions in 2024. The total annualised energy use and generation emissions are 0.3% of Ireland's ETS 2030 emissions target and 1% of the Electricity sector budget. Total annualised industry-related emissions are 0.007% of Ireland's non-ETS 2030 emissions target and 0.0001% of the 2030 Industry budget. The estimated annualised GHG emissions associated with transport-related activities are 0.03% of the 2030 Transport budget, while annualised waste GHG emissions are 0.00001% of the Waste budget.

In the unlikely ('Maximum') operational scenario, the estimated total GHG emissions, when annualised over the 25-year Proposed Development lifespan, are equivalent to 5% of Ireland's total GHG emissions in 2024. The total annualised energy use and generation emissions are 24% of Ireland's ETS 2030 emissions target and 103% of the Electricity sector budget. Total annualised industry-related emissions are 0.007% of Ireland's non-ETS 2030 emissions target and 0.0001% of the 2030 Industry budget. The estimated annualised GHG emissions associated with transport-related activities are 0.03% of the 2030 Transport budget, while annualised waste GHG emissions are 0.00001% of the Waste budget.

Table 9.7 Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO_2e)		Proposed Development	Annualised Development GHG Emissions (tCO_2e)		% of Relevant Target/ Budget	
			Expected	Maximum	Expected	Maximum
Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	Total GHG Emissions	39,815	3,079,111	0.07%	5%
Non-ETS 2030 Target	27,721,670	Total GHG Emissions (non electricity)	1909	1909	0.007%	0.007%
ETS 2030 Target	12,953,240	Total GHG Emissions (electricity)	35,193	3,077,202	0.3%	24%
2030 Sectoral Budget (Industry Sector)	4,000,000	Total Industry Emissions	5	5	0.0001%	0.0001%
2030 Sectoral Budget (Transport Sector)	6,000,000	Total Transport Emissions	1,904	1,904	0.03%	0.03%
2030 Sectoral Budget (Electricity Sector)	3,000,000	Total Electricity Emissions	35,193	3,077,202	1%	103%
2030 Sectoral Budget (Waste Sector)	1,000,000	Total Waste Emissions	0.1	0.1	0.00001%	0.00001%

9.5.2.4 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 9.6 has been taken into account when determining the significance of the Proposed Development's GHG emissions. Both the likely 'Expected" emissions scenario and the unlikely "Maximum" emissions scenario have been taken into account. In both scenarios, the Proposed Development is fully in line with national climate policy, as CAP25 specifically gives a key target of installing "at least 2 GW" of new flexible gas plant, intended to produce a *"more flexible energy system, reducing the strain on the power system, and ensuring that we maximise our renewables potential."* The Proposed Development will provide 0.68 GW of this capacity. Additionally, the proposed development will replace operations of higher emitting power plants (particularly oil-fired units) resulting in an overall reduction of carbon emissions in the Single Electricity Market (SEM), as shown in the assessment *Appendix 9.3 – "A comparison of future carbon emissions within the SEM with and without the Kilshane GT"* submitted as part of the planning application for Phase 1 of the development (Planning ref. FW22A/0204).

According to the TII significance criteria described in Section 9.3.2.3 and Table 9.3, the significance of the GHG emissions during the construction and operational phase is minor adverse. The Proposed Development has mitigated GHG impacts and is fully in line with Ireland's national climate policy and its trajectory towards net zero.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase, which is ***direct, long-term, negative*** and ***slight***, which is overall ***not significant***.

9.5.3 Climate Change Risk Assessment

9.5.3.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out as there are no residual medium or high-risk vulnerabilities to climate change hazards. However, consideration has been given to the Proposed Development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 9.6.1:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major Storm Damage including wind damage.

9.5.3.2 Operational Phase

The sensitivity and exposure of the development to various climate hazards must first be determined to then determine the vulnerability of the Proposed Development to climate change. Flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog have been considered as climate hazards in the context of the Proposed Development.

The sensitivity of the Proposed Development to the climate hazards is assessed irrespective of the project location. Table 9.8 details the sensitivity of the Proposed Development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the Proposed Development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project

location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the Proposed Development to each of the climate hazards as per Table 9.4. The results of the vulnerability assessment are detailed in Table 9.8.

Table 9.8 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the Proposed Development area was determined with reference to several online tools and with input from the various discipline specialists on the project team. It was concluded that the Proposed Development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

9.5.3.2.1 Flooding

A Flood Risk Assessment (FRA) was undertaken Waterman Moylan Consulting Engineers Limited and is submitted as part of this planning application. This document was reviewed to inform the climate change vulnerability assessment and assess the potential for flooding at the Proposed Development site.

The FRA assessed the risk of flooding from tidal, fluvial, groundwater and pluvial sources. Due to the location of the Proposed Development, tidal flooding is not a risk to the site. The Proposed Development is within Flood Zone C, which indicates flooding is not a risk for the site. The development's drainage design includes for a 20% climate change allowance. The 20% climate change allowance aligns with the RCP4.5 'Medium Risk' future scenario.

Based on the information provided in the FRA it can be concluded that overall, the Proposed Development has low vulnerability to flood risk.

9.5.3.2.2 Extreme Wind, Fog, Lightning & Hail

In relation to extreme winds, the buildings shall be designed to the appropriate standards to account for the relevant wind loadings events for RCP4.5 and RCP8.5. If required as part of the building design, lightning protection shall be provided for. Hail and fog are not predicted to significantly affect any structures due to their design.

9.5.3.2.3 Wildfires

In relation to wildfires, the Think Hazard! tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2025), indicates that the wildfire hazard is classified as low for the Dublin area. This means that there is between a 4% and 10% chance of experiencing weather that could support a problematic wildfire in your project area that may cause disruptions and low but tangible risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions. These include increases in temperature and prolonged dry periods. Due to the project location in a largely agricultural and urban area the risk of wildfire, and it can be concluded that the Proposed Development is of low vulnerability to wildfires.

9.5.3.2.4 Landslides

The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to inform the risk from landslides at the Proposed Development. There have not been any historical landslide events in the vicinity of the Proposed Development and most of the site area is classed as low vulnerability to landslides according to the GSI landslide susceptibility mapping database (GSI, 2025). Therefore, the vulnerability of the Proposed Development to landslides is classed as low.

9.5.3.2.5 Extreme Temperatures (Heat & Cold) & Drought

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure. However, high quality, durable building materials are proposed for the development. There is a low risk of damage to the structure from extreme heat.

As drainage infrastructure are buried in the ground, the shorter-term changes in temperature are less pronounced because the soil acts as an insulating layer. In addition to the committed incorporated design measures, the architects will be using guidance documents to inform with design detail decisions during the latter phases of the Proposed Development post-planning consent including the EU Commission Technical Guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest available IPCC report. In addition, should updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be considered.

9.5.3.2.6 Summary

Overall, the Proposed Development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

9.5.3.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the Proposed Development due to climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the Proposed Development due to climate change during the operational phase are ***direct, long-term, negative*** and ***imperceptible***, which is overall not significant in EIA terms.

9.6 Mitigation Measures

9.6.1 Construction Phase

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.

- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. A construction waste management plan will be implemented to minimise construction waste sent to landfills. Recycling of materials will be promoted to and reduce the environmental footprint of the site.
- Sourcing materials locally will be prioritised. This will help to reduce transport related CO_2 emissions and helps support local suppliers, further promoting economic sustainability.
- Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible.

In terms of impact on the Proposed Development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding and other extreme weather events through site risk assessments and method statements. Contractors' Environmental Management System (EMS) should consider all measures deemed necessary to manage extreme weather events and should as a minimum, cover training of personnel and, prevention and monitoring arrangements. Construction method statements should also consider extreme weather events where risks have been identified. Emergency preparedness and contingency procedures in place for an extreme weather event on the construction site or within the supply chain. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction i.e. concrete should not be poured during extreme temperatures. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), and the latest IPCC report.

9.6.2 Operational Phase

The majority of the GHG emissions associated with the Proposed Development originate from the combustion of natural gas by the turbine during the operational phase.

While natural gas is the most likely fuel for the turbine at the time of this assessment, the turbine will also be capable of using biomethane as a fuel source in the future. Biomethane meets the same technical standards as natural gas, and as such is fully compatible with existing gas infrastructure and installations. Biomethane is considered a zero GHG emissions fuel (once it is produced according to the Renewable Energy Directive's life cycle sustainability criteria) and its availability on the market is due to increase in the future, driven by Gas Networks Ireland's (GNI) strategy for decarbonisation *Pathway to a Net Zero Carbon Network* (GNI, 2024) and the *National Biomethane Strategy* (Government of Ireland, 2024d). GNI's strategy is to fully decarbonise its gas network by 2045, phasing out natural gas entirely and delivering biomethane and hydrogen in its stead.

The *National Biomethane Strategy* (Government of Ireland, 2024d) is Ireland's first major policy statement on biomethane and is an important milestone in the development of an indigenous sector. The strategy sets out twenty-five actions to be delivered in the coming years to enable the development of the sector and to achieve the government's target of 5.7 Terawatt hours (TWh) of indigenously produced biomethane by 2030. The publication of this strategy was coupled with the launch of grant aid towards development of the sector which is expected to drive expansion of the anaerobic digestion sector towards achieving the 2030 target. This target represents approx. 12% of projected networked gas.

Additionally GNI's *Biomethane Energy Report* (GNI, 2023) indicates that currently Ireland has a prospective 14.8 TWh of annual biomethane production with over 75% of potential projects within 'economic' direct connection to the gas network. GNI conclude that "*a biomethane sector with the momentum and*

conditions to reach 5.7 TWh annual production by 2030 would reasonably be expected to approach realisation of its currently identified potential by 2040". It is therefore likely that the Proposed Development will be fuelled by significantly more biomethane than natural gas within its proposed lifespan. Biomethane can be classified as "a zero-carbon rated fuel" if it satisfies the Renewable Energy Directive's life cycle sustainability criteria, and will therefore directly contribute to meeting Ireland's decarbonisation targets. It is therefore expected that the use of biomethane by the Proposed Development within its proposed lifespan will result in near-zero emissions from the operation of the turbines.

Substantial progress on the decarbonisation of the national gas network via biomethane and hydrogen replacement of natural gas is considered highly likely during the lifespan of the Proposed Development, and it is therefore expected that the use of natural gas and the associated GHG emissions will reduce throughout the operational phase relative to the development's opening year.

9.7 Monitoring or Reinstatement Measures

There are no monitoring requirements in relation to climate.

9.8 Residual Effects of the Proposed Development

The impact to climate as a result of a Proposed Development must be assessed as a whole for all phases. The Proposed Development will result in some impacts to climate through the release of GHGs. TII reference the ISEP GHG Guidance which states that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". The Proposed Development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. The Proposed Development is fully in line with national climate policy, as CAP25 specifically gives a key target of installing "at least 2 GW" (i.e. more than 2 GW is allowed) of new flexible gas plant, intended to produce a *"more flexible energy system, reducing the strain on the power system, and ensuring that we maximise our renewables potential."* The Proposed Development will provide 0.68 GW of this capacity.

As per the assessment criteria in Table 9.3 the residual impact of the Proposed Development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the Proposed Development as a result of climate change. The residual effect of climate change on the Proposed Development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

9.9 Compliance with Section 15 of the Climate Action and Low Carbon Development Act 2015

Section 15 of the 2015 Act, sets out the duties imposed by certain bodies, including local authorities and An Coimisiún Pleanála. This section was amended by the 2021 Act and states:

"(1) A relevant body shall, in so far as practicable, perform its functions in a manner consistent with—

(a) the most recent approved climate action plan,

(b) the most recent approved national long term climate action strategy,

(c) the most recent approved national adaptation framework and approved sectoral adaptation plans,

(d) the furtherance of the national climate objective, and

(e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.".

This chapter demonstrates how the Proposed Development is consistent with the objectives of Section 15 of the 2015 Act (as amended). The EIAR has carried out a greenhouse gas emissions assessment and assessed the Proposed Scheme's resilience/adaptation to climate change.

- Greenhouse Gas Emissions Assessment – This assessment considers the Proposed Development's GHG emissions over its lifetime (see Section 9.5.2). The assessment analyses these emissions in the context of the relevant carbon budgets, targets and policies to ensure consistency with the most recent approved climate action plan and the most recent approved national long term climate action strategy, and with measures in furtherance of the national climate objective. This complies with subsections 15 (1) (a), (b), and (d) of the Act.
- Climate Change Vulnerability Assessment – This assessment identifies the impact of a changing climate on the Proposed Scheme and receiving environment in the context of the most recent approved national adaptation framework and approved sectoral adaptation plans. The assessment considers the Proposed Scheme's vulnerability and adaption to climate change and identifies adaptation measures to increase resilience, as discussed in Section 9.5.3.2. This covers sections 15(1)(c) and (e) of the Act.

The above measures pursue the furtherance of the national climate objective and the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State as far as practicable as required by section 15(1)(d) and(e) of the Acts.

9.10 Cumulative Impacts of the Proposed Development

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that:

"*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area and the full masterplan development. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the Proposed Development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

9.11 References

- Civil Engineering Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database.
- Construction Industry Federation (2021) Modern Methods of Construction
- Environmental Protection Agency (EPA) (2020a) State of the Irish Environment Report (Chapter 2: Climate Change)
- Environmental Protection Agency (EPA) (2020b) Research 339: High-Resolution Climate Projections for Ireland – A Multi-Model Ensemble Approach
- Environmental Protection Agency (EPA) (2021a) Critical Infrastructure Vulnerability to Climate Change

- Environmental Protection Agency (EPA) (2021b) What impact will climate change have for Ireland? [Online] Available at https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/
- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (EPA) (2025a) Ireland's Final Greenhouse Gas Emissions 1990-2024
- Environmental Protection Agency (EPA) (2025b) Ireland's Greenhouse Gas Emissions Projections 2024-2055
- European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment
- European Commission (2014) 2030 Climate and Energy Policy Framework
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
- European Commission (2021a) Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027
- European Commission (2021b) 2030 EU Climate Target Plan
- European Commission (2021b) Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.
- European Union (2018) Regulation 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
- Fingal County Council & Codema (2019) Fingal County Council Climate Change Action Plan 2019 - 2024
- Gas Networks Ireland (2023) Biomethane Energy Report
- Gas Networks Ireland (2024) Pathway to a Net Zero Carbon Network
- Global Facility for Disaster Reduction and Recovery (GFDRR) (2025) Think Hazard!
- Government of Ireland (2015) Climate Action and Low Carbon Development Act
- Government of Ireland (2018) Climate Action Plan 2019
- Government of Ireland (2020) Climate Action Plan 2021
- Government of Ireland (2021) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021)
- Government of Ireland (2022) Climate Action Plan 2022
- Government of Ireland (2023a) Climate Action Plan (CAP) 2024
- Government of Ireland (2023b) National Hydrogen Strategy
- Government of Ireland (2024a) Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027)
- Government of Ireland (2024b) Long-Term Strategy on Greenhouse Gas Emissions Reductions
- Government of Ireland (2024c) National Adaptation Framework (NAF)
- Government of Ireland (2024d) National Biomethane Strategy
- Government of Ireland (2025) Climate Action Plan (CAP) 2025
- Institute of Sustainability & Environmental Professionals (ISEP) (formerly known as IEMA) (2020a) Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation
- Institute of Sustainability & Environmental Professionals (ISEP) (formerly known as IEMA) (2020b) GHG Management Hierarchy
- Institute of Sustainability & Environmental Professionals (ISEP) (formerly known as IEMA) (2022) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance
- Met Éireann (2024a) TRANSLATE: One Climate Resource for Ireland. [Online] Available at: https://www.met.ie/science/translate
- Met Éireann (2024b) Ireland's 30-year Climate Averages [Online] Available at: https://www.met.ie/climate/30-year-averages
- Met Éireann (2024c). TRANSLATE research report.
- Met Éireann (2025) 2024 Climate Statement

- Sustainable Energy Authority of Ireland (SEAI) (2025). Conversion Factors. Available from: seai.ie/data-and-insights/seai-statistics/conversion-factors/
- The Geological Society of Ireland (GSI) (2025) Landslide Susceptibility Mapping Database
- Transport Infrastructure Ireland (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document
- Transport Infrastructure Ireland (2022b) PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects
- Transport Infrastructure Ireland (2025) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document
- Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

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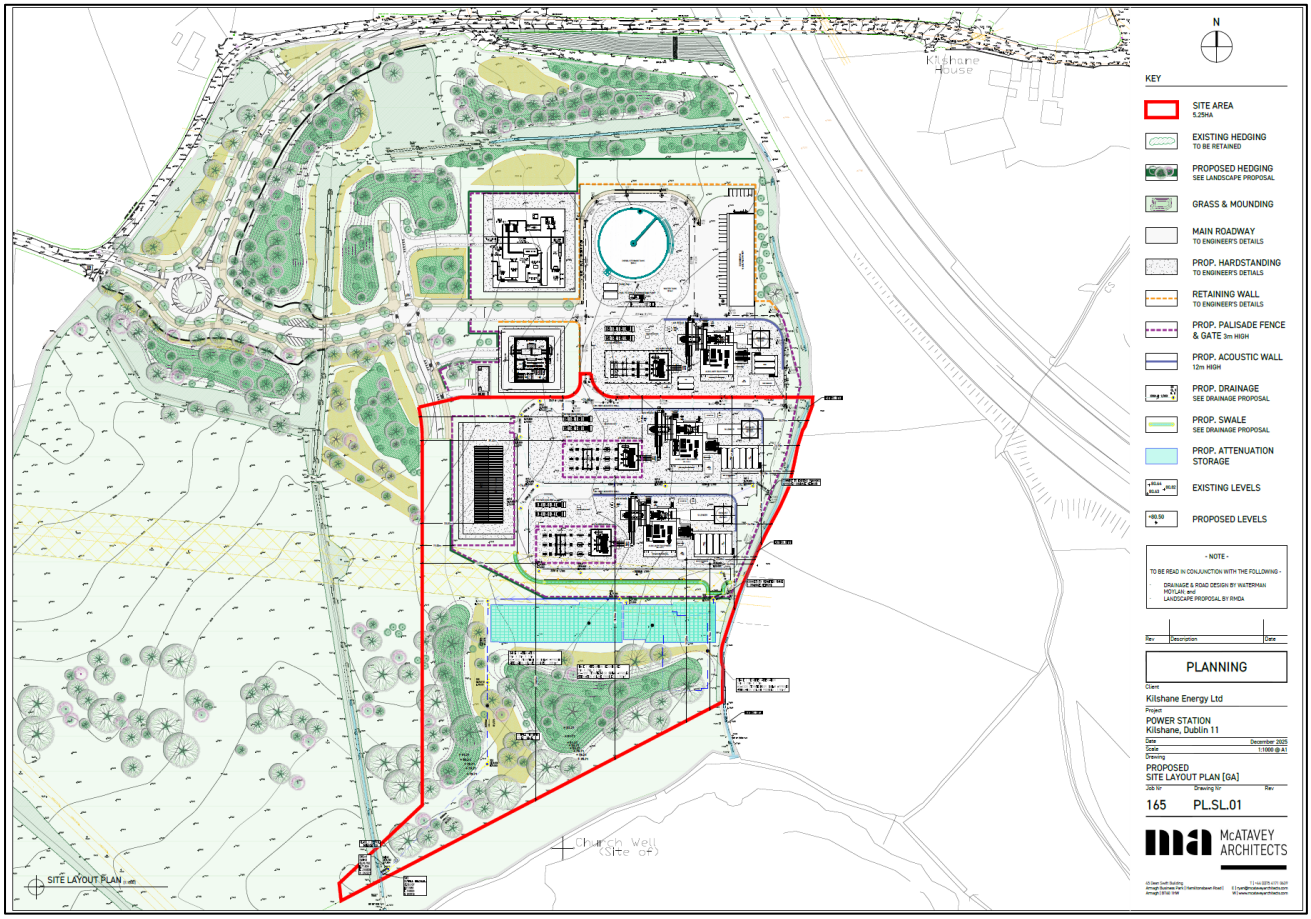
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10. NOISE AND VIBRATION

10.1 Introduction/Methodology

As detailed in Chapter 1 Introduction, this EIA Report has been prepared to accompany an application for the Proposed Development which comprises the construction of two additional gas turbines with an output of 340 Megawatts (MW) per turbine, with a total additional output of 680 Megawatts to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11. The Proposed Development site is located west of the N2 Primary Road and approximately 2 km north-west of the M50 motorway. The subject site is illustrated in Figure 10-1 below.

Figure 10-1 Proposed Development[1]



(See Chapter 2 – Description of Proposed Development and accompanying document set for more detailed drawings)

The nearest noise-sensitive locations (NSLs) are located to the west and east of the development lands on sections of the Kilshane Road; the majority of the NSLs are residential dwellings, and the remainder are commercial buildings.

[1] McATAVEY ARCHITECTS, drawing no. PL.SL.01

10.1.1 Methodology

10.1.1.1 Proposed Approach

The following methodology has been adopted for this assessment:

- Review appropriate guidance, typical local authority planning conditions, etc. in order to identify appropriate noise criteria for the site operations;
- Carry out noise monitoring (e.g. in the vicinity of nearest sensitive properties/boundaries) to identify existing levels of noise in the vicinity of the development;
- Development of a detailed 3D noise model to consider the Proposed Development; and
- Comment on predicted levels against the appropriate criteria and existing noise levels and outline required mitigation measures (if any).

Appendix 10.1 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.

10.1.1.2 Fundamentals of Acoustics

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

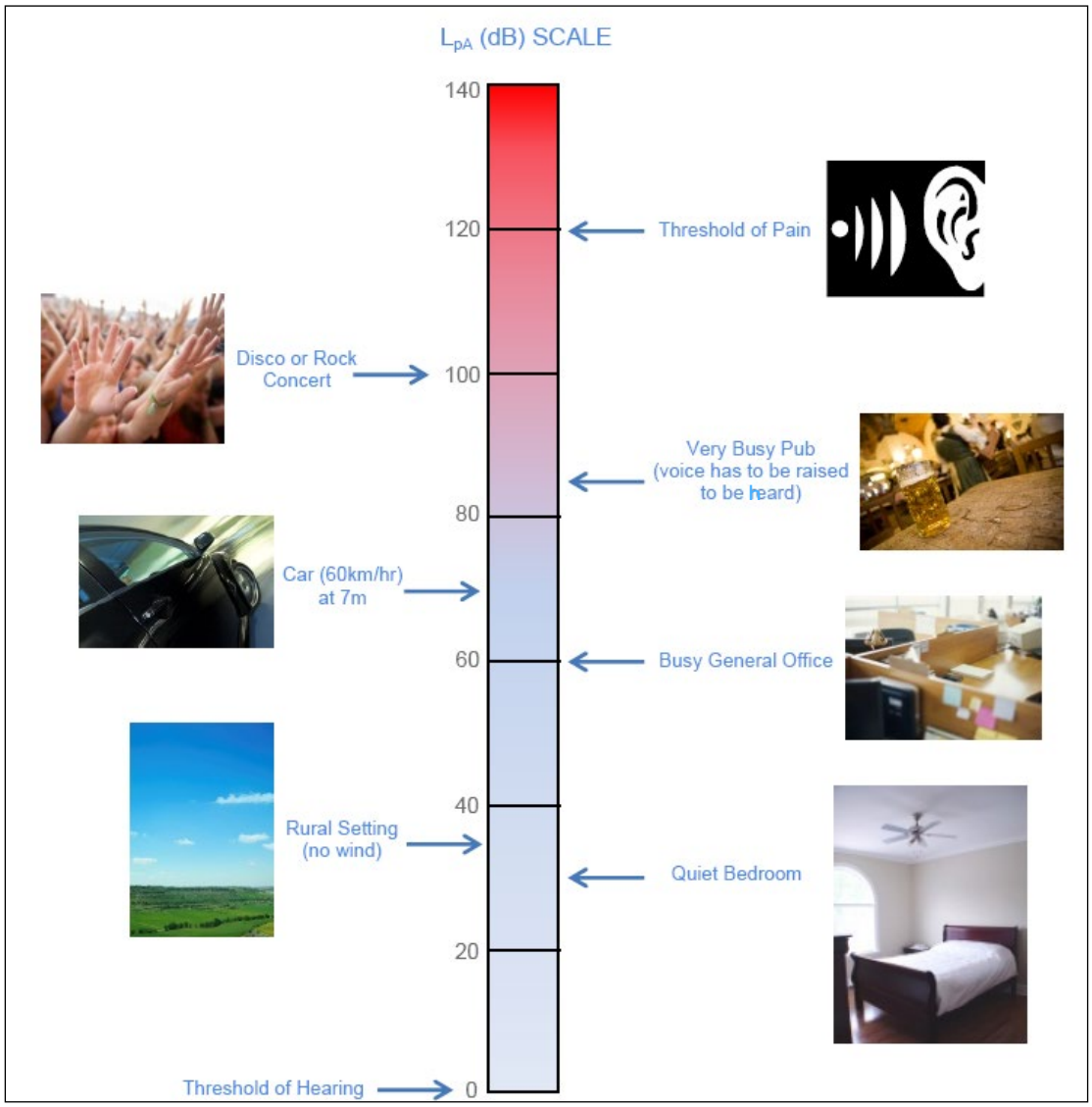
A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient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

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

The frequency of sound is the rate at which a sound wave oscillates, and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. Several weighting mechanisms have been proposed but the 'A-weighting' system has been found to provide one of the best correlations with perceived loudness. SPL's measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 10-2.

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 10-2 dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2012))



10.1.1.3 Significance of Impacts

The significance of noise and vibration impacts has been assessed in accordance with the EPA Guidelines EIA Reports (2022); see Table 10-1 to Table 10-3. As these guidelines do not quantify the impacts in decibel terms, further reference has been made to the 'Guidelines for Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA) (2014).

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

Table 10-1 Quality of Potential Effects

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

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

Table 10-2 Significance of Effects

Significance of Impact on the Receiving Environment	Description of Potential Effect
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.

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

Table 10-3 Duration of Effects

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

10.1.1.4 Construction Phase Guidance

10.1.1.4.1 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 here calls for the designation of a NSL 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 potentially significant noise impact is associated with the construction activities.

The BS 5228 – 1 document sets out guidance on permissible noise levels relative to the existing noise environment. Table 10-4 sets out the values which, when exceeded, signify a significant effect at the façades of residential receptors as recommended by BS 5228 – 1.

Table 10-4 Example Threshold of Significant Effect at Dwellings

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

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

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

For the appropriate periods (i.e. daytime, evening and night-time) the ambient noise level is determined and rounded to the nearest 5dB. Baseline monitoring carried out at the nearest NSLs (See Section 10.3) and considered in this assessment indicate that Category A applies based on the measured levels at UN1 and Category B applies based on the measured levels at UN2, as detailed in Table 10-5 is appropriate in this instance.

Table 10-5 Rounded Baseline Noise Levels and Associated Categories

Period	Baseline Noise Category	Construction Noise Threshold Value $L_{Aeq,1hr}$ (dB)
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	A-B	65-70

See Section 10.4.1for the assessment in relation to the Proposed Development. If the construction noise level exceeds the appropriate category value, then a potential significant effect is deemed to occur.

This assessment process determines if a significant construction noise impact is likely. Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise set out in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*. The noise levels in Table 10-6 should not be exceeded at NSLs during the construction phase of the Proposed Development.

Table 10-6 Maximum Permissible Noise Levels at the Façade of Dwellings during Construction

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq,1hr}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 23:00hrs	60*	65*
Saturdays 07:00 to 13:00hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Based on the above the following construction noise criteria are proposed for the site:

70dB $L_{Aeq,1hr}$ at noise sensitive locations
75dB $L_{Aeq,1hr}$ at commercial locations

It will be required that noise-generating external construction activities associated with development shall take place between the hours of:

Mondays to Fridays – 7am to 7pm
Saturday – 7am to 2pm
On Sundays and Public Holidays: no activity on the site.

If it is deemed necessary to conduct works outside these times, prior written approval will be sought from the relevant local authority.

10.1.1.4.2 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 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014); and
British Standard BS 7385-2 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (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 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 10-7.

Table 10-7 Allowable Vibration during Construction Phase

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 and major structural damage can occur at vibration magnitudes greater than four times those in Table 10-7.

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 10-8.

Table 10-8 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.

Note A The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
Note B A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
Note 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 6472-1:2008 *Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting* or BS 6472-2:2008 *Guide to evaluation of human exposure to vibration in buildings - Blast-induced vibration*, 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.

10.1.1.4.3 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: *Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2* (hereafter referred to as DMRB Noise and Vibration) (HE 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 (HE 2020) document.

Table 10-9 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 10-9 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	Clearly perceptible	Major	Significant

10.1.1.4.4 Potential Impact from Noise and Vibration on Human Health

Noise criteria are provided by relevant bodies with consideration of the likely impact of noise on human health. The construction phase is short-term and therefore any elevated levels of noise will be of limited duration and, as a result, are not expected to pose any risk to human health. In terms of the noise exposure of construction workers and potential hearing damage that may be caused due to exposure to high levels of noise, the Safety, Health and Welfare at Work (General Application) Regulations 2007 (Statutory Instrument No. 299 of 2007) provides guidance in terms of allowable workplace noise exposure levels for employees. The Regulations specify two noise Action Levels at which the employer is legally obliged to reduce the risk of exposure to noise. The appointed contractor will be required to comply with the Regulations and provide appropriate noise exposure mitigation measures where necessary. Therefore, in the absence of mitigation there is the potential for direct, short-term, negative and slight impacts to human health as a result of the Proposed Development.

10.1.1.5 Operational Phase - Noise Guidance

10.1.1.5.1 EPA NG4

It is understood that the development will operate under the provisions of an Environmental Protection Agency (EPA) Industrial Emissions (IE) license. The discussion of appropriate IE License noise emission criteria for the overall facility will be conducted in accordance with the NG4 document. This approach is summarized below in accordance with guidance detailed in Section 4 of the (EPA) document Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2016.

10.1.1.5.2 Quiet Area Screening

The Proposed Development is not considered a quiet area in this instance as it fails to meet any of the criteria outlined in EPA's Guidance. The most stringent of these criteria are noted in bullet point and commented on below.

At least 3km from urban area with a population >1,000 people;

> The site within the Dublin agglomeration and is therefore located less than 3km from a population significantly greater than 1,000.

At least 3km away from any local industry;

> Other industrial sites operate within 3km of the site.

At least 5km away from any National Primary Route;

A section of the N2 national road is located along the western boundary of the site.

10.1.1.5.3 Low Background Noise Area Screening

In order to establish whether the NSLs in the vicinity of the site would be considered 'low background noise' areas, the noise levels measured during the environmental noise survey need to satisfy all three of the following criteria:

Arithmetic Average of L_{A90} During Daytime Period (07:00 to 19:00hrs) ≤40 dB L_{A90}, and;
Arithmetic Average of L_{A90} During Evening Period (19:00 to 23:00hrs) ≤35 dB L_{A90}, and;
Arithmetic Average of L_{A90} During Night-time Period (23:00 to 07:00hrs) ≤30 dB L_{A90}.

Table 10-10 Comparison of Measurement Results with NG4 Low Background Noise Area Criteria

Location	Period	$L_{A90,T}$ dB	NG4 Screening (dB $L_{A90,T}$)	Satisfies All Criteria for Low Background Noise Area?
UN1	Daytime	53	≤40	No
	Evening	50	≤35	
	Night-time	49	≤30	
UN2	Daytime	58	≤40	No
	Evening	56	≤35	
	Night-time	53	≤30	

The arithmetic average L_{A90} results at the monitoring location considered here (see Section 10.3) are compared against the criteria in Table 10-10. The locations UN1 and UN2 would not be considered a 'Areas of Low Background Noise' as the measured noise levels do not satisfy the criteria.

10.1.1.5.4 Determining Appropriate Noise Criteria

Based on the EPA NG4 guidance, the following noise criteria are appropriate at the nearest NSL's to the facility:

Daytime (07:00 to 19:00hrs) 55dB $L_{Ar,15min}$
Evening (19:00 to 23:00hrs) 50dB $L_{Ar,15min}$
Night-time (23:00 to 07:00hrs) 45dB $L_{Aeq,15min}$

During the night-time period, no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL. The applicable noise criteria identified are in line with the typical limit values for noise from licensed sites.

10.1.1.5.5 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 10-11 below and is based on an example scale within the IEMA guidelines. The corresponding significance of effect presented in the EPA EIA Report Guidelines (2022) is also presented.

Table 10-11 Noise Effect Scale

Noise Level Change dB(A)	Subjective Response	Long Term Impact Classification (IEMA, 2014)	Impact Guidelines on the Information to be contained in EIA Report's (EPA)
≥ 0	No change	Negligible	Imperceptible
≥ 0 and < 3	Barely perceptible	Not Significant	Not Significant
≥ 3 and < 5	Noticeable	Minor	Slight Impact
≥ 5 and < 10	Clearly perceptible	Moderate	Moderate Impact
≥10	More than a doubling or halving of loudness	Major	Significant Impact

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.

The night-time conditions will dictate the design of the development from an acoustic perspective so this will be focused on in this assessment as compliance with the night-time criterion infers compliance with the daytime one.

10.1.1.5.6 Recommended Criteria

Following review of relevant guidance, the following noise criteria are proposed for the Proposed Development:

Daytime Periods (Residential) – 55 dB $L_{Aeq,15min}$
Daytime Periods (Commercial) – 55 dB $L_{Aeq,15min}$
Evening Periods (Residential) – 50 dB $L_{Aeq,15min}$
Night-time Periods (Residential) – 45 dB $L_{Aeq,15min}$

These criteria apply at the façades of the locations.

Note plant noise emissions are to be designed such that they are not tonal and do not have impulsive characteristics or excessive low frequency noise at the nearest NSLs.

10.1.1.6 Operational Phase – Vibration Guidance

Guidance as to an acceptable magnitude of vibration during the operational phase of the development is best taken from British Standard BS 6472-1:2008 *Guide to Evaluation of human exposure to vibration in buildings - Vibration sources other than blasting*. The Standard contains recommendations that continuous

vibration in residential buildings should not exceed nominally 0.3mm/s by daytime and 0.2mm/s by night-time.

It should be noted that the Proposed Development will not give rise to any significant levels of vibration off site and therefore the associated impact is not significant.

10.1.1.7 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*.

Prediction calculations for building services noise, car park activity and vehicle movements on site have been conducted generally in accordance with ISO 9613 (1996): *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation*.

Changes in road traffic noise on the local road network have been considered using prediction guidance contained within Calculation of Road Traffic Noise (CRTN) issued by the UK Department of Transport Welsh Office in 1988.

10.2 The Proposed Development

The subject site is located at lands at Kilshane Road, Kilshane, Finglas, Dublin 11. The Proposed Development consists of the following:

The Proposed Development will consist of the construction of two additional Gas Turbines and associated infrastructure at the permitted Kilshane Gas Turbine Power Generation Station (development ref. FW22A/0204, ABP-317480-23). As per the site notice, the Proposed Development will consist of:

- 2 additional gas turbines producing 340MW each. The gas turbines are identical to the gas turbine in Phase 1.
- 400kV GIS (Gas Insulated Switchgear) building where high-voltage electricity is switched and managed and associated compound
- Access roads
- Electrical substation

In respect of operating hours of the Proposed Development, the following section from Chapter 2 is relevant:

> *The plant is forecasted to operate for between 22 and 100 hours in a year per turbine with an annual average of 46 hours. The plant is required to be available to follow dispatch instructions from Eirgrid, the Transmission System Operator (TSO). The TSO will decide the actual operating hours of the unit depending on system needs at any point in time.*

In this assessment, the criteria in terms of noise level limits are appropriate for a continuously operating development, though as stated above the proportion of the time is equivalent to a number of days per year. The noise assessment presented here is therefore 'worst case'.

10.3 The Receiving Environment

An environmental noise survey has been conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2007: *Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

10.3.1 Noise Surveys

Noise measurements were conducted using an unattended noise monitoring over five days that encompassed typical day, evening and night-time periods. The night-time survey provides a measure of existing background noise levels during a period where people are attempting to go to sleep or are sleeping. As the development will have capacity to operate at any time of day or night, the potential impact during night-time periods is the critical issue. The survey was conducted from 8th July 2025 to 11th July 2025.

10.3.2 Measurement Locations

Figure 10-3 details the approximate location of the measurement positions identified above.

Figure 10-3 Noise Survey Locations



10.3.3 Methodology

Sample periods for the noise measurements were 15 minutes. Results were saved to the instrument memory for later analysis. Survey personnel noted the primary noise sources contributing to noise build-up during installation and removal of the equipment from site.

10.3.4 Survey Results

The survey results for Location UN1 and UN2 are summarised in Table 10-12 below.

Table 10-12 Review of Typical Noise Levels

Date	Day	Period	Ambient Noise dB $L_{Aeq,T}$		Background Noise dB $L_{A90,T}$	
			UN1	UN2	UN1	UN2
08/07/2025	Tuesday	Evening	54	58	46	54
		Night	58	59	44	50
09/07/2025	Wednesday	Day	57	60	51	57
		Evening	54	59	48	55
		Night	59	60	45	51
10/07/2025	Thursday	Day	58	62	54	59
		Evening	57	61	53	58
		Night	62	62	52	55
Average		Day	58	61	53	58
		Evening	55	60	50	56
		Night	60	61	49	53

These typical noise levels have been considered when discussing appropriate noise criteria in relation to the development (see Section 10.1.1.5).

10.3.5 Nearest Noise-Sensitive Locations

In the first instance it is considered appropriate to define a NSL. In this context, it is considered prudent to give consideration to the definition supplied by the Environmental Protection Agency (EPA) which states the following:

> *"NSL – any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels."*

Figure 10-4 highlights the nearest NSLs for which noise predictions have been carried out. Descriptions of the locations are presented in Table 10-13.

Figure 10-4 Noise-Sensitive Locations

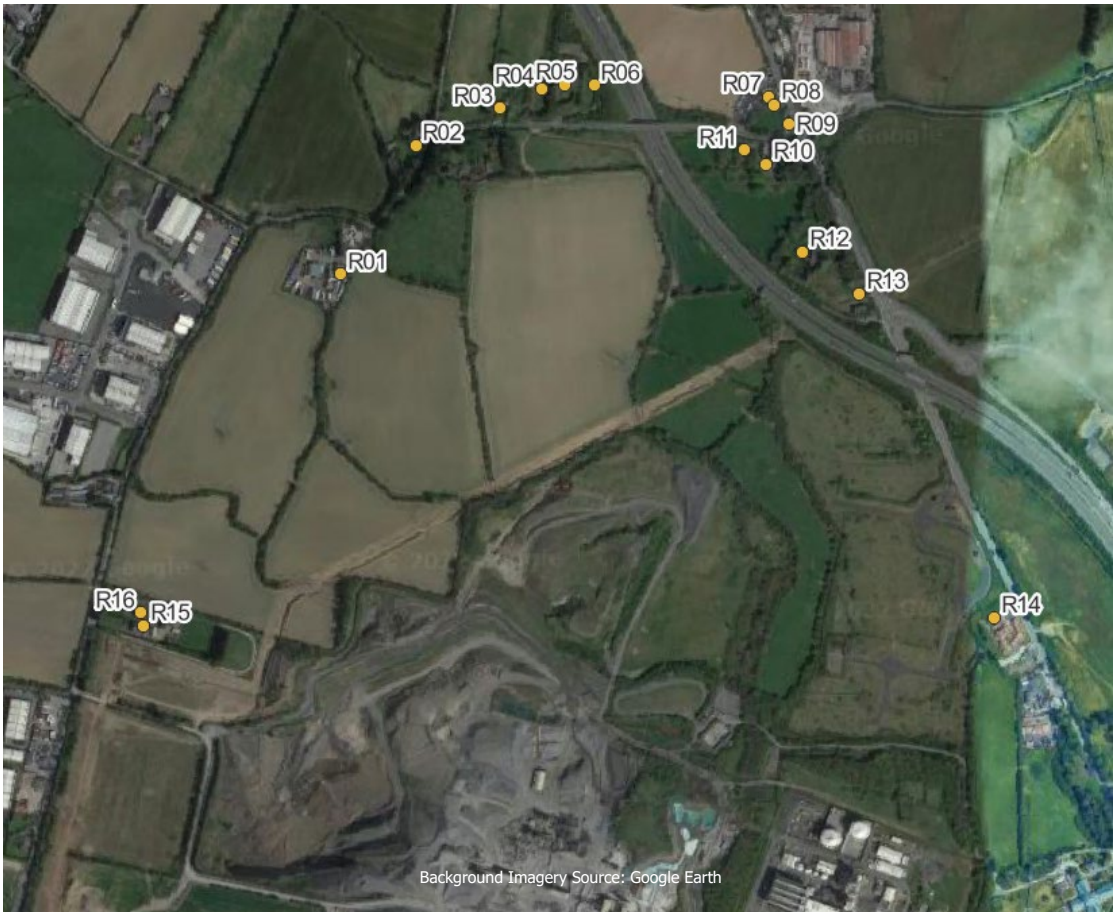


Table 10-13 Noise-sensitive Locations

Location Ref	Description
R01	Commercial property on Kilshane Road
R02	Residential properties on Kilshane Road
R03	According to Planning Authority Case Reference: FW24A/0339E, these receivers will be demolished and used as storage container depot. They will be excluded from the current assessment
R04	
R05	
R06	
R07	Residential properties on North of Kilshane Cross / on R135
R08	
R09	
R10	Residential properties on Kilshane Road
R11	
R12	Residential properties south of Kilshane Cross
R13	
R14	Residential properties at Ravenswood
R15	Residential properties on Kilshane Road to southwest of site
R16	

10.4 Potential Impacts

The Proposed Development will involve the construction of two additional gas-fired power plant and associated ancillary buildings and equipment over an anticipated construction period of approximately 33 months.

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages:

Construction phase, and;
Operational phase.

The construction phase will involve extensive excavation, rock breaking, general site preparation over the development site and the erection of new buildings over a phased construction period. Comment will also be presented in the following sections in relation to construction traffic on local roads in terms of noise and vibration.

The primary sources of outward noise in the operational context are deemed long term and will involve:

Building services noise;
Emergency site operations, and;
Additional vehicular traffic on public roads.

These issues are discussed in detailed in the following sections.

10.4.1 Construction Phase

The largest noise and vibration impact of the Proposed Development will occur during the construction phase due to the use of various plant machinery and HGV movement to, from and around the site. However, the construction phase can be classed as a short-term phase.

The nearest residential NSLs are more than 100m from the gas generator compound.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB $L_{Aeq,T}$ at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB L_{WA}. This worst-case scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other.

Table 10-14 Predicted Construction Noise Levels

Description of Noise Source	Calculated noise levels at varying distances (dB $L_{Aeq,1hr}$)				
	50 m	60 m	70 m	80 m	100 m
3 no. items each with SPL of 81 dB at 10 m operating simultaneously	70	68	67	66	64

The calculated noise levels in Table 10-14 show that there is predicted noise levels are within the adopted construction noise criteria of 70 dB $L_{Aeq,1hr}$. This indicates that construction noise effects are ***negative, not significant*** and ***short-term***.

10.4.1.1 Construction Vibration

Potential for vibration impacts during the construction phase programme are likely to be limited to excavations and piling works to be used for foundations. For the purposes of this assessment the expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

0.54mm/s at a distance of 5m, for auguring;
0.22mm/s at a distance of 5m, for twisting in casing;
0.42mm/s at a distance of 5m, for spinning off, and;
0.43mm/s at a distance of 5m, for boring with rock auger.

Considering the low vibration levels at very close distances to the piling rigs, vibration levels at the nearest buildings are not expected to pose any significance in terms of cosmetic or structural damage. In addition, the range of vibration levels is typically below a level which would cause any disturbance to occupants of nearby buildings. This indicates that construction vibration effects are ***negative, not significant*** and ***short-term***.

10.4.1.2 Construction Traffic

In terms of the construction traffic on local roads that will be generated as a result of the Proposed Development reference is made to Table 13-7 in Chapter 13, where the increase of traffic during construction phase is expected to be less than 5%. According to the calculation methods in Calculation of Road Traffic Noise (CRTN), in order to increase traffic noise levels by 1dB traffic volumes would need to increase by the order of 25%. With reference to Table 10-9 it is considered that a 1dB increase in traffic noise levels on the local road network, due to the construction phase, will not result in a significant noise impact.

10.4.2 Operational Phase

The primary sources of outward noise in the operational context are deemed medium term and will involve:

Power plant noise, and
Additional vehicular traffic on public roads.

These issues are discussed in following sections. See Appendices 10.2 and 10.3 for details of the noise modelling undertaken for this assessment and associated assumptions.

10.4.2.1 Power Station Noise

In relation to the power plant noise there are two modes in which the dual-fuel power plant can operate:

- Gas fuel operation, and
- Liquid fuel operation.

Certain items of plant are relevant to only one mode: in gas fuel operation, the demineralised water pump, fuel oil pump and liquid fuel module do not operate; in liquid fuel operation, the fuel gas heater skid and separator skid do not operate. These plant items will be installed within a building with sufficient sound insulation to ensure their noise contribution will be insignificant. Therefore, only one scenario will be evaluated in this assessment.

For details of the noise model and input information, see Appendices 10.2 and 10.3.

The results of the iterations of the noise model are presented and are compared to the relevant noise criteria as adopted for this assessment in Table 10-15. Note all plant will be selected such that no tonal or excessive low frequency noise emissions are evident at NSLs.

The predicted levels are based on a situation where the receiver is downwind of all noise sources. For the purposes of the assessment against the adopted criteria this is a robust worst-case assumption.

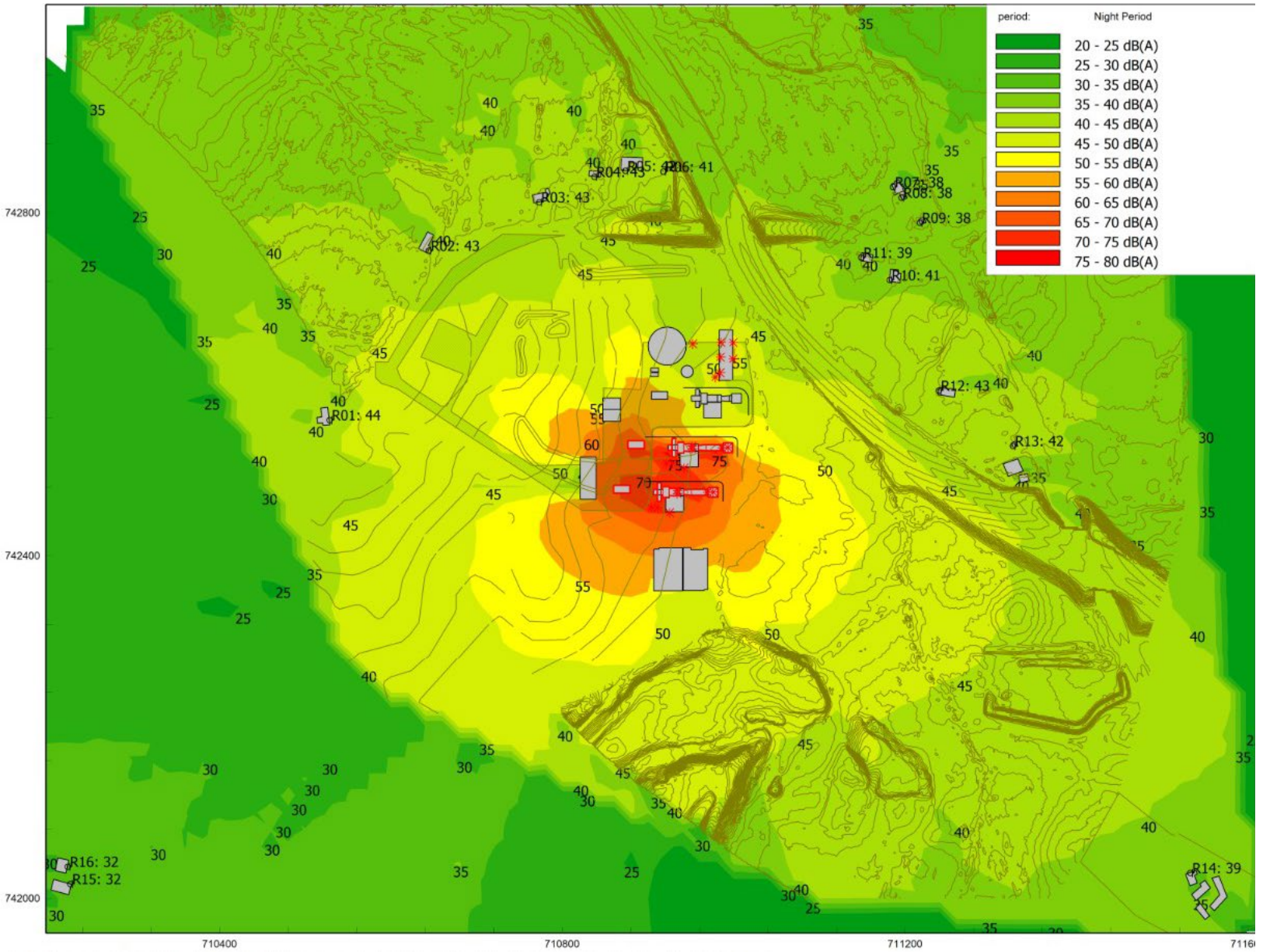
A noise contour plot for normal operation scenario is presented in Figure 10-5.

Table 10-15 Comparison of Predicted Noise Levels vs. Adopted Noise Criteria

Location	Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies?
R01[A]	44	55 (Daytime)	✓
		--	--
		--	--
R02	43	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R07	37	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R08	38	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R09	37	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R10	41	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R11	39	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R12	43	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R13	42	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R14	39	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R15	38	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓
R16	39	55 (Daytime)	✓
		50 (Evening)	✓
		45 (Night)	✓

Note A R01 is a commercial NSL therefore criteria are not provided for evening and night-time periods.

Figure 10-5 Noise Contours Normal Operation



10.4.2.2 Review of Increases in Noise Level

The power plant may be required to operate during day, evening or night periods; however, this section of the assessment focuses on night-time periods, which are the most sensitive. The average background noise levels during night-time periods are, as presented in Table 10-12, 49 dB L_{A90} at UN1 and 53 dB L_{A90} at UN2.

Table 10-16 Review of Increases in Night-time Noise Level

Location	Predicted dB $L_{Aeq,T}$	Background dB $L_{A90,15min}$	Cumulative [a] dB $L_{A90,15min}$	Change in Noise Level	EPA Glossary of Impacts
R01	44	49	50	+1	Not Significant
R02	43	49	50	+1	Not Significant
R07	37	53	53	0	Imperceptible
R08	38	53	53	0	Imperceptible
R09	37	53	53	0	Imperceptible
R10	41	53	53	0	Imperceptible
R11	39	53	53	0	Imperceptible
R12	43	53	53	0	Imperceptible
R13	42	53	53	0	Imperceptible
R14	39	53	53	0	Imperceptible
R15	38	49	49	0	Imperceptible
R16	39	49	49	0	Imperceptible

a. The cumulative level is the logarithmic sum of the predicted noise level and the background noise level. Note that although the predicted noise level is presented in terms of $L_{Aeq,T}$ the constant operation of the source allows the combined $L_{Aeq,T}$ and $L_{A90,15min}$ to be presented as a cumulative $L_{A90,15min}$.

Review of the predicted increases in noise level at the nearest NSLs conclude that the associated effect ranges from 'imperceptible' at R07 to R16 to the east and southwest, to 'not significant' at R01 and R02 to the northwest of the Proposed Development.

10.4.2.3 Additional Vehicular Traffic on Public Roads

Moreover, in terms of the additional traffic on local roads that will be generated as a result of this development, the following comment is presented. With reference to Chapter 13, the Proposed Development will not add a significant amount of additional traffic to the surrounding road network during operation. Considering that in order to increase traffic noise levels by 1dB, traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the Proposed Development will not result in a significant noise impact.

10.4.2.4 Summary of Operational Impacts

In terms of noise associated with the operation of the site, the associated effect is stated to be ***negative, imperceptible*** to ***Not Significant*** and ***long-term***.

There are no sources of vibration associated with the operation of the development will give rise to impacts at nearby NSLs. In terms of these the operational phase of the development the associated vibration effect is stated to be ***neutral, imperceptible*** and ***long-term***.

10.5 Mitigation and Monitoring Measures

10.5.1 Construction Phase

With regard to construction activities, reference will be made to BS 5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. The following mitigation measures will be applied during the construction of the Proposed Development:

- 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 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, including:

- 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; and
- 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.

Vibration from construction activities to off-site residences be limited to the values set out in Table 10-7. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes will proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%.

10.5.2 Operational Phase

10.5.2.1 Power Station Noise

The sound power levels of the proposed plant items are detailed in Appendix 10.2. Noise from external plant will be minimised by purchasing low noise generating equipment and incorporating appropriately specified in line attenuators for stacks and exhausts where necessary. With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment.

The 12m high barrier also presented in Appendix 10.2 was designed in conjunction with the project engineering team to reduce noise levels at NSLs.

10.5.2.2 Additional Vehicular Traffic on Public Roads

The noise impact assessment outlined previously has demonstrated that mitigation measures are not required.

10.6 Residual Impacts

This section summarises the likely noise and vibration impact associated with the Proposed Development, taking into account the mitigation measures.

10.6.1 Construction Phase

During the construction phase of 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 10-5 and Table 10-6), along with implementation of appropriate noise and vibration control measures (as summarised in Section 10.5.1), will ensure that noise and vibration impact is kept to a minimum. Also, it is reiterated that any construction noise effects will be ***not significant, negative*** and ***short term*** in nature.

10.6.2 Operational Phase

10.6.2.1 Power Station Noise

Proprietary noise and vibration control measures have been employed including plant selection and acoustic screening, in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby NSLs. In addition, noise emissions will be broadband in nature and will not contain any tonal or impulsive elements. The resultant noise effect is ***negative, not significant*** to ***slight*** and ***long-term***.

10.6.2.2 Additional Vehicular Traffic on Public Roads

Any change in noise levels associated with vehicles at road junctions in the vicinity of the Proposed Development is expected to be imperceptible. The resultant noise effect is ***neutral, imperceptible*** and ***long term***.

10.7 Cumulative Impact

10.7.1 Existing Developments

The environmental noise surveys (Section 10.3) take account of any noise emissions from existing developments. It was noted that the existing ambient noise levels in the area were dominated by aircraft and road traffic noise from the local road network.

At certain locations during night-time periods where existing background noise levels were measured in the range of 35 to 50 dB $L_{A90,15min}$, low levels of plant noise from the Proposed Development may be audible during lulls in other sources. Notwithstanding this, the resulting cumulative background noise levels will be within the adopted night-time noise criteria outlined in relevant EPA noise criteria that are applicable to the development.

10.7.2 Related Developments

There are two closely related projects that are not part of the subject proposal but are integral to its operation:

- an Above Ground Installation (AGI);
- a Gas Insulated Switchgear (GIS) facility.

Neither of these projects likely to give rise to significant noise or vibration effects in their own right, during either the construction phase or the operational phase. Therefore, there is accordingly no likely significant noise or vibration effect when considered cumulatively with the proposed power station development.

10.7.3 Future Developments

10.7.3.1 Phase 1 Development

Phase 1 of the Proposed Development had been approved as a separate application. Phase 1 consists of one similar gas turbine within the development boundary. The cumulative impact for both phase 1 and phase 2 is presented in Table 10-17 and Table 10-18 for gas operation and liquid operation, respectively.

Table 10-17 Review of Cumulative Noise Impact – Gas Operation

Location	Predicted dB $L_{Aeq,T}$		Background dB $L_{A90,15min}$	Cumulative [a] dB $L_{A90,15min}$	Change in Noise Level	EPA Glossary of Impacts
	Phase 1	Phase 2				
R01	45	44	49	51	2	Not Significant
R02	44	43	49	51	2	Not Significant
R07	41	37	53	53	0	Imperceptible
R08	41	38	53	53	0	Imperceptible
R09	41	37	53	53	0	Imperceptible
R10	44	41	53	54	1	Not Significant
R11	44	39	53	54	1	Not Significant
R12	41	43	53	54	1	Not Significant
R13	43	42	53	54	1	Not Significant
R14	37	39	53	53	0	Imperceptible
R15	35	38	49	49	0	Imperceptible
R16	35	39	49	50	1	Not Significant

a. The cumulative level is the logarithmic sum of the predicted noise level and the background noise level. Note that although the predicted noise level is presented in terms of $L_{Aeq,T}$ the constant operation of the source allows the combined $L_{Aeq,T}$ and $L_{A90,15min}$ to be presented as a cumulative $L_{A90,15min}$.

A review of the predicted increases in noise level at the nearest NSLs conclude that the associated effect ranges from 'imperceptible' at R07 to R09, R14 and R15, to 'not significant' at R01, R02, R10 to R13 and R16.

Table 10-18 Review of Cumulative Noise Impact – Liquid Operation

Location	Predicted dB $L_{Aeq,T}$		Background dB $L_{A90,15min}$	Cumulative [a] dB $L_{A90,15min}$	Change in Noise Level	EPA Glossary of Impacts
	Phase 1	Phase 2				
R01	46	44	49	52	3	Slight
R02	45	43	49	51	2	Not Significant
R07	42	37	53	53	0	Imperceptible
R08	41	38	53	53	0	Imperceptible
R09	41	37	53	53	0	Imperceptible
R10	45	41	53	54	1	Not Significant
R11	44	39	53	54	1	Not Significant
R12	43	43	53	54	1	Not Significant
R13	45	42	53	54	1	Not Significant
R14	40	39	53	53	0	Imperceptible
R15	37	38	49	50	1	Not Significant
R16	37	39	49	50	1	Not Significant

b. The cumulative level is the logarithmic sum of the predicted noise level and the background noise level. Note that although the predicted noise level is presented in terms of $L_{Aeq,T}$ the constant operation of the source allows the combined $L_{Aeq,T}$ and $L_{A90,15min}$ to be presented as a cumulative $L_{A90,15min}$.

A review of the predicted increases in noise level at the nearest NSLs conclude that the associated effect ranges from 'imperceptible' at R07 to R09 and R14, to 'Slight' at R01.

10.7.3.2 Substation and Grid Connection

As part of a separate application, a substation is proposed within the development boundary, together with an associated grid connection along public roads to Cruiserath substation.

In 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 220KvA transformer installations:

> *"The survey on the 220kv substation at Gorman indicated that measured noise levels (L_{Aeq}) were approximately 43dB(A) at 5m from the most affected boundary of the substation. This is marginally above the WHO night-time threshold limit for preventing disturbance to sleep (i.e. 42dB). Spectral analysis of the noise from the Gorman substation demonstrated that there are a number of distinct tonal elements to noise in the low to mid frequency range. To avoid any noise impacts from 220kV substations at sensitive receptors, it is recommended that a distance of 20m is maintained between the nearest site boundary and the nearest sensitive receptor."*

Considering the distance between the proposed substation and the nearest off site locations of some 150m noise from this installation is not predicted to be an issue off site.

10.7.3.2.1 Other Developments

The additional turbines proposed as part of the Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that EirGrid will submit an application for a new gridline in due course. Construction of the grid connection will be covered by a separate Environmental Impact Assessment Report (EIAR). Concurrent construction activities with the proposed development are not expected and cumulative construction noise impact is unlikely.

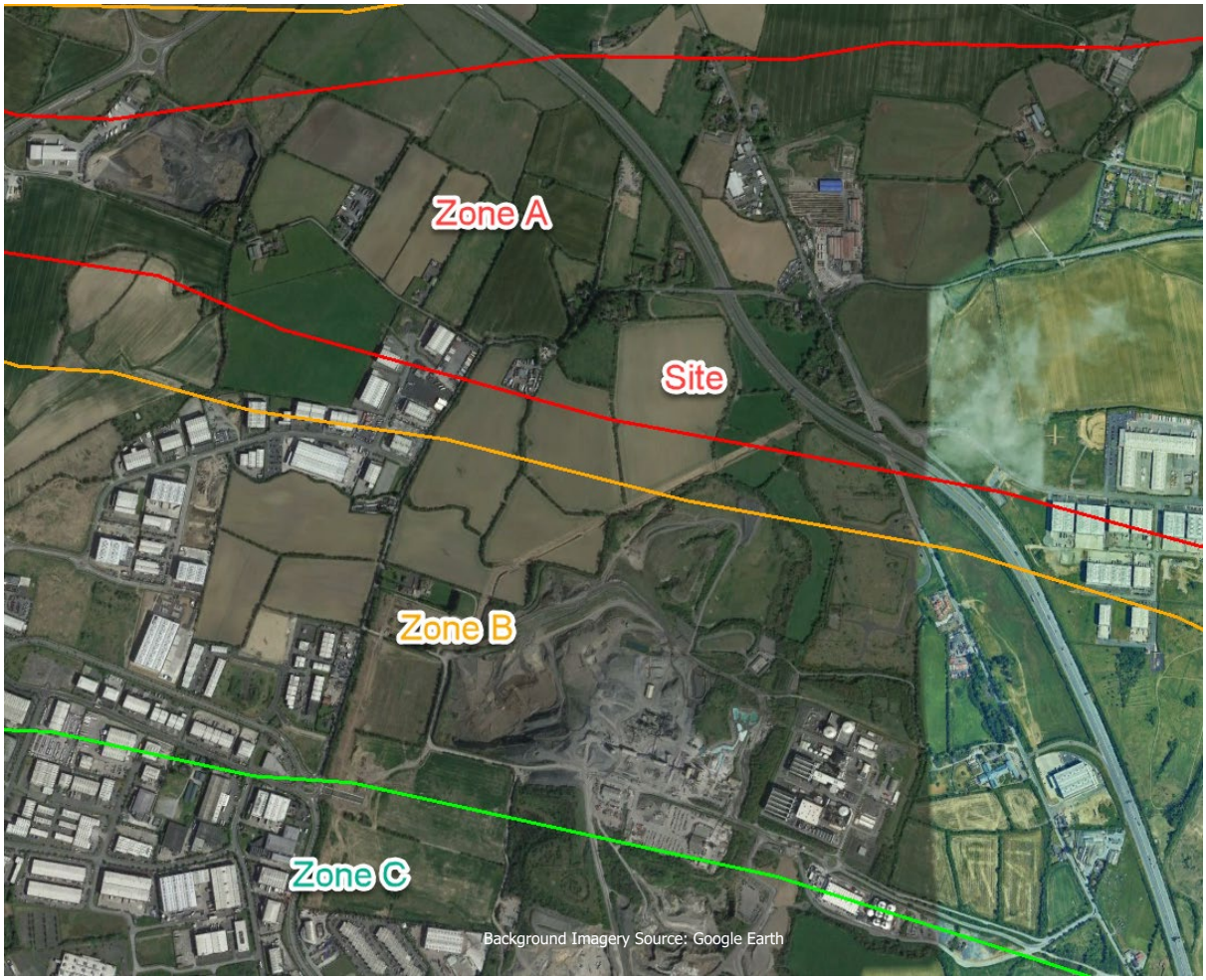
The Fingal County Council planning file has been reviewed and a number of developments in the local area have been identified, as listed in Appendix 17.1. These specific developments have been reviewed for any likelihood of a significant cumulative noise impact.

In respect of noise, taking into account the additional distance from these developments to noise-sensitive locations assessed here, and that the low number of operations hours per year of the proposed Kilshane Energy Centre, it is not considered that a significant cumulative noise or vibration impact is likely.

10.8 Comment on Airport Noise Zone

As a final comment, it is noted that the development lands in question fall within the adopted Noise Zone A as outlined in the Fingal Development Plan 2023-2029.

Figure 10-6 Airport Noise Zones



Four noise zones (Zone A to D) are indicated representing potential site exposure to aircraft exposure. Table 10-19 below outlines the objectives to be adhered to by applicants for developments in each zone. In the first instance the following comment in relation to the aim of Zone A should be noted:

"To resist new provision for residential development and other noise sensitive uses."

Table 10-19 Airport Noise Zones

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
A	≥ 63 dB $L_{Aeq,\ 16hr}$ and/or ≥ 55 dB L_{night}	To resist new provision for residential development and other noise sensitive uses. "All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted."

On the basis the development will operate primarily during the daytime period, the worst-case daytime aircraft noise level incident to the façade would fall in the region of 63 dB $L_{Aeq,16\ hour}$.

10.8.1 Guidance on Intrusive Noise Levels

The Dublin Noise Action Plan and relevant guidance referenced therein call for developments to have a good level of sound insulation in accordance with best Irish practice. There is no Irish standard guidance that is directly applicable to this scenario, hence it is proposed to make reference to BS8233 for the purposes of arriving at appropriate design goals.

The British Standard BS 8233: 2014: *Guidance on sound insulation and noise reduction for buildings* sets out recommended internal noise levels for several different building types from external noise sources such as road and air traffic. The guidance is primarily for use by designers, hence BS 8233 may be used as the basis for the development of an appropriate schedule of noise control measures.

The recommended indoor ambient noise levels in a commercial building are shown in Table 10-20.

Table 10-20 Recommended indoor ambient noise levels in a commercial building

Activity	Location	Design range dB $L_{Aeq,T}$
Speech or telephone communications	Department Store, Canteen, Kitchen	50 – 55
Typical noise levels for acoustic privacy in shared spaces	Open Plan Office	45 – 50
Study and work requiring concentration	Meeting Room	35 – 45

10.8.2 Calculation Of Future Intrusive Aircraft Noise Levels

10.8.2.1 Proposed Façade Elements

Calculation of noise break-in from the outside environment to the control room, meeting room and office spaces in the development have been carried out in order to select a minimum sound reduction performance for the glazing and vents in order to provide a good internal noise environment in accordance with the criteria in Table 10-20. The specification of glazing elements including lab or estimated sound insulation performance values have been presented in Table 10-21. Values are also provided for fresh air vents, for the case where they are to be incorporated at detailed design stage.

Table 10-21 Façade Element Specification

Element	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
Glazing	23	17	27	39	44	38
Vents (2 per room)	36	28	26	28	30	30

10.8.2.2 Predicted Internal Noise Levels

Using the predicted noise levels outlined in Section 10.7 and the sound reduction performances of the building elements in Table 10-21, the predicted intrusive noise levels for office space within the open plan office areas of the development has been calculated in accordance with BS EN ISO 12354-3:2017 *Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Airborne sound insulation against outdoor sound*.

Based on the expected external noise level and the constructions detailed above the predicted internal noise levels within the building arising from future aircraft noise levels are of the order of 45 dB $L_{Aeq,T}$. It is important to note that this falls within the recommended values as outlined in Table 10-20above. It is

concluded that no further mitigation measures are required in respect of inward impact of environmental noise.

10.9 References

EPA Guidelines on Information to be contained in Environmental Impact Statements (2002).

Draft 'Guidelines for Noise Impact Assessment' produced by the Institute of Acoustics/Institute of Environmental Management and Assessment Working Party.

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 Good Practice 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.

Environmental Protection Agency 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 6472-1:2008 Guide to Evaluation of human exposure to vibration in buildings - Vibration sources other than blasting.

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 Welsh Office in 1988.

BS EN 1793-1:1998: Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 1: Intrinsic characteristics of sound absorption

BS EN 1793-2:1998: Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 2: Intrinsic characteristics of airborne sound insulation.

BS EN 1794-1:2003: Road traffic noise reducing devices. Non-acoustic performance. Mechanical performance and stability requirements

BS EN 1794-2:2003: Road traffic noise reducing devices. Non-acoustic performance. General safety and environmental requirements.

Chapter 11 – Landscape and Visual Impact

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11. LANDSCAPE AND VISUAL IMPACT

11.1 Introduction

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for an extension to the permitted Kilshane Gas to Energy Plant, in the townland of Kilshane, Finglas, Dublin 11.

This LVIA describes the landscape context of the Proposed Development and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

- Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

11.1.1 Approach and Statement of Authority

This LVIA adopts an approach that is founded in the following best practice guidance documents:

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

11.2 Methodology

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape:

'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded.

11.2.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

'This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.'

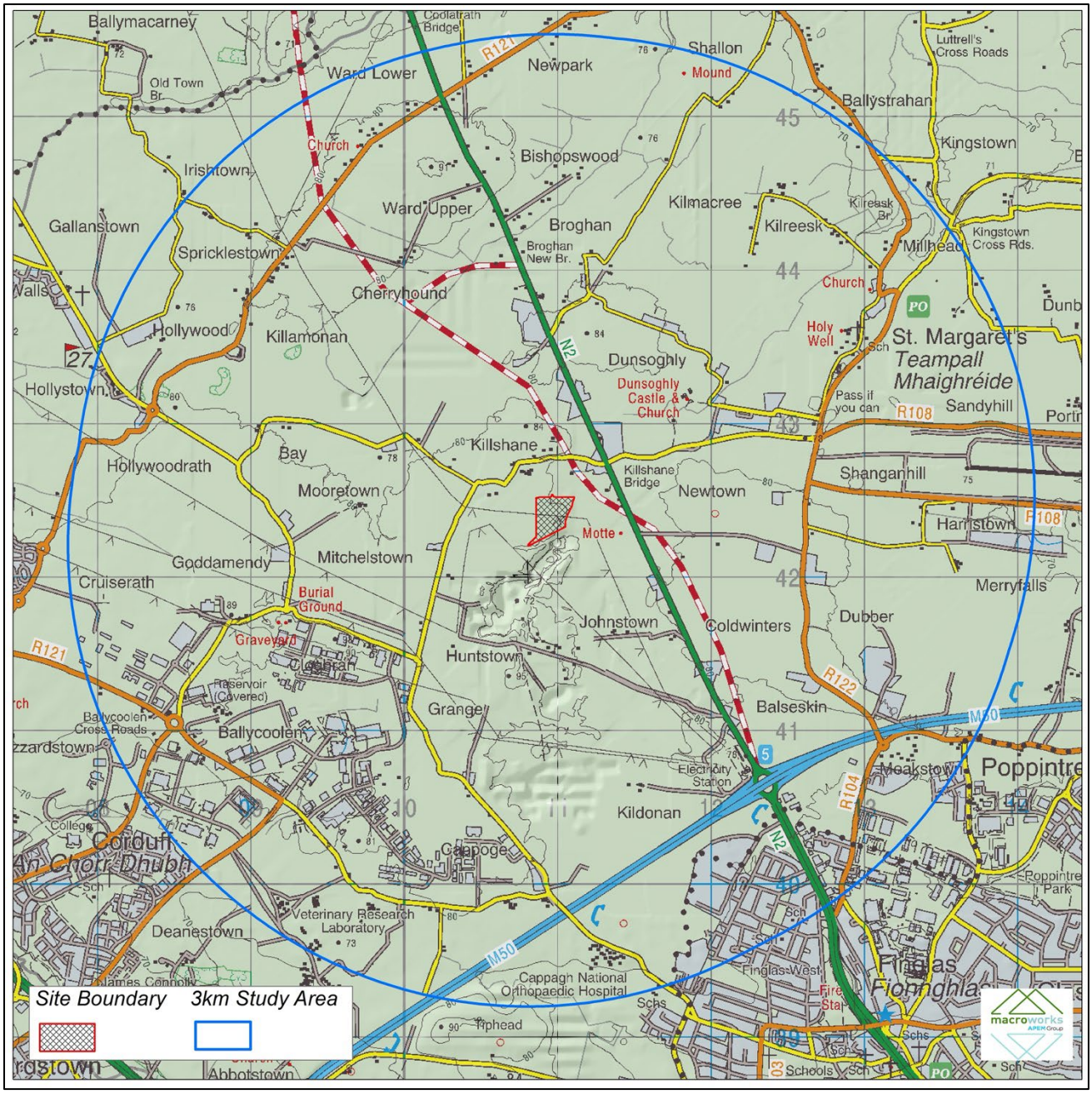
The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The LVIA Methodology can be summarised as undertaking the following key tasks:

- Desk study and site visits in June 2025;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the Proposed Development;
- Consideration of Mitigation Measures;
- Assessment of Landscape Effects;
- Assessment of Visual Effects; and
- Summary Statement of Significance.

11.2.2 Study Area

From similar studies, it is anticipated that the Proposed Development is likely to be difficult to discern beyond approximately 3km and is not likely to give rise to significant landscape or visual impacts beyond approximately 1-2km. In the interests of a comprehensive appraisal, a 3km radius study area is used in this instance.

Figure 11.1 Extent of 3km Study Area



11.2.3 Landscape Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the Proposed Development will affect the physical features and fabric of the landscape, and then how the proposals influence landscape character with reference to published descriptions of character and an understanding of the contemporary character of the landscape as informed through desktop and site studies.

When assessing the potential landscape effects of the development, the value and sensitivity of the landscape receptor is weighed against the magnitude of impact to determine the significance of the landscape effect. Criteria outlined below are used to guide these judgements.

11.2.3.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in Table 11.1.

Table 11.1. Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

11.2.3.2 Magnitude of Change - Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the Proposed Development and to a lesser extent the duration and reversibility of that effect. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 11.2 outlines criteria used to inform this judgement.

Table 11.2. Magnitude of Change - Landscape

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.

Criteria	Description
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

11.2.4 Visual Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the Proposed Development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the Proposed Development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the Proposed Development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

11.2.4.1 Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

11.2.4.2 Susceptibility of Visual Receptors to Change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- "Residents at home;

- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
- Visual receptors that are less susceptible to changes in views and visual amenity include;
- "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

11.2.4.3 Value attached to Views

The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;

- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

11.2.4.4 Magnitude of Change – Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the Proposed Development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided in Table 11.3.

Table 11.3. Magnitude of Change - Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

11.2.5 Significance of Effect

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately

described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at Table 11.4 below as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at Table 11.5.

Table 11.4. Significance Matrix

	Sensitivity of Receptor				
Magnitude	**Very High**	**High**	**Medium**	**Low**	**Negligible**
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 11.5. Indicative Significance of effect criteria descriptions

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.

	Landscape	Visual
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

11.2.6 Quality of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

11.3 Receiving Environment

11.3.1 Landscape and Visual Policy Context and Designations

11.3.1.1 Fingal Development Plan 2023-2029

Section 9.6.14 of the current Fingal Development Plan incorporates a Landscape Character Assessment for the County;

"The Landscape Character Assessment (LCA) provides for the classification of Fingal's landscapes into the following (1) types and values and (2) sensitivities. Landscape Character Types represent generic areas of distinctive character that makes one landscape different from another such as uplands or the coast, while Sensitivity is evaluated using criteria ranging from high to low. A highly sensitive landscape is likely to be vulnerable to change whereas a landscape with a low sensitivity is likely to be less at risk from change."

Of the 6 Landscape Character Types identified within the CDP, the site is contained in the southwestern part of the 'Low Lying Agricultural' LCT (Figure 11.2 below) which is designated a 'Modest' Landscape Value and 'Low' Landscape Sensitivity. The Low Lying LCT is described as follows:

> *"Low Lying Character Type has an open character combined with large field patterns, few tree belts and low roadside hedges. The main settlements located within the area include Oldtown, Ballyboghil and Lusk and parts of Malahide and Donabate. Dublin Airport is located in this area. This low-lying area is dominated by agriculture and a number of settlements. The area is categorised as having a modest value. It contains pockets of important value areas requiring particular attention such as important archaeological monuments and demesnes and also the Feltrim Hill and Santry Demesne proposed Natural Heritage Areas."*

A number of principles for development relating to the preservation of landscape character include:

- *Protect skylines and ridgelines from development.*
- *Require any necessary assessments, including visual impact assessments, to be prepared prior to approving development in highly sensitive areas.*
- *Ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types, including the retention of important features or characteristics, taking into account the various elements which contribute to their distinctiveness such as geology and landform, habitats, scenic quality, settlement pattern, historic heritage, local vernacular heritage, land-use and tranquillity.*

Low to Medium Sensitive Character Types are described within the CDP as follows:

> *"these landscapes can absorb a certain amount of development once the scale and forms are kept simple and surrounded by adequate screen boundaries and appropriate landscaping to reduce impact on the rural character of the surrounding roads. The protection of views and riparian corridors from inappropriate development is of paramount importance in these areas."*

Figure 11.2 Approximate location of Proposed Development in relation to Landscape Character Types, as identified in the Fingal Development Plan 2023-2029



Zoning Objectives

'Sheet 12 Blanchardstown North 2023-2029' of the Fingal CDP illustrates the zoning objectives within the study area. The entire application site occurs within the 'HI-Heavy Industry' zone, with a zoning objective to *"Provide for heavy industry."* The 'Heavy Industry' zoning accommodates the majority of the central study area.

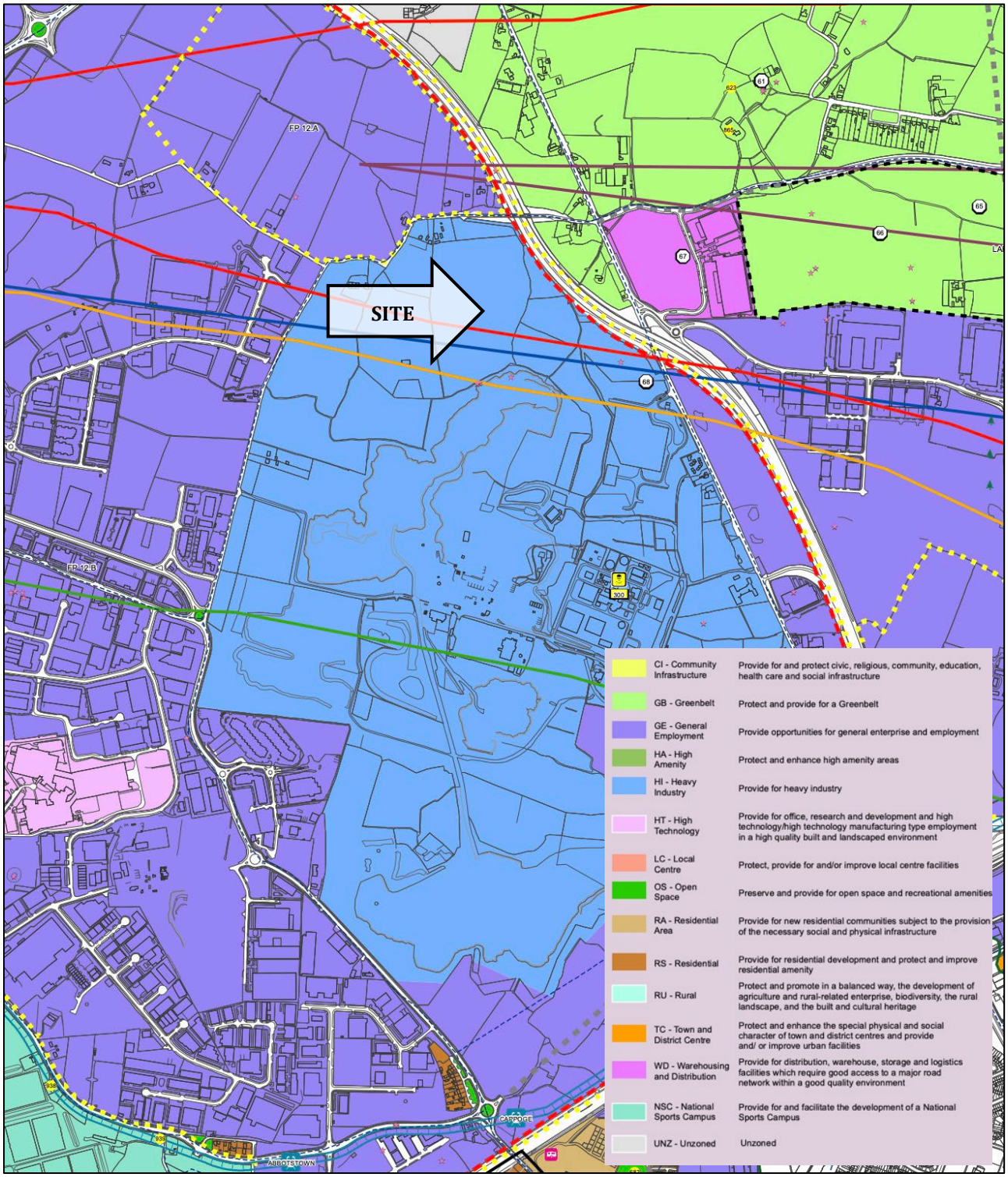
The stated vision for this zone is as follows: *"Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and*

processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."

With regard to permitted activities, 'Sustainable Energy Installation', 'Plant Storage', 'High Impact Industry' are all deemed 'Permitted in Principle'. 'Sustainable Energy Installation' is permitted *"Ancillary to main use and of an appropriate scale."*

The surrounding land is zoned 'General Employment' to the south, east, and west. To the northeast of the Proposed Development a small area is zoned for 'Warehousing and Distribution'. The remainder of the northeast quadrant is zoned 'Green Belt' with an area zoned for 'Dublin Airport' occupying the wider northeast periphery.

Figure 11.3 Extract from Sheet No.12 of the Fingal Development Plan, identifying zoning areas in relation to the Proposed Development

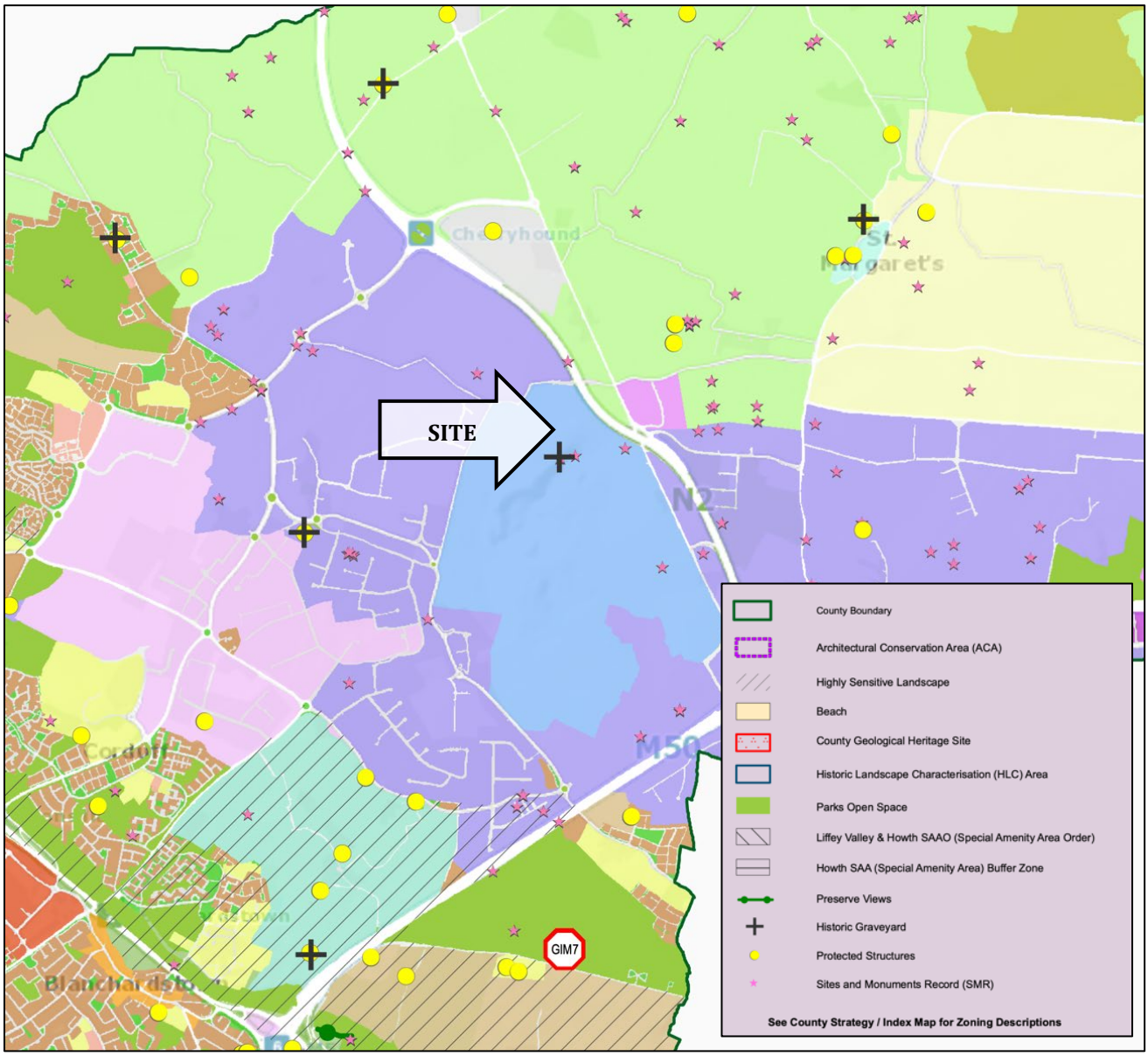


High Sensitivity Landscapes

'Sheet No.14 Green Infrastructure Map 1 2023-2029' includes High Amenity Areas and High Sensitivity Landscapes (HSL). As can be seen in Figure 11.4 below, the southwest portion of the study area,

approximately 2.3km from the Proposed Development, is designated a 'Highly Sensitive Landscape'. This refers to 'Blanchardstown north'.

Figure 11.4 Extract from Sheet No. 14 of the Fingal Development Plan, identifying both Zoning and Green Infrastructure Objectives



11.3.2 Views of Recognised Scenic Value – Fingal Development Plan 2023-2029

Views of recognised scenic value are primarily indicated within county development plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, websites, guidebooks, roadside rest stops or on postcards that represent the area.

Based on a review of Sheet No. 14 – 'Green Infrastructure' within the current Fingal Development Plan, there are no views located within the study area.

11.3.3 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the Proposed Development will be assessed. A description of the landscape context of the proposed application site and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development. The visual resource will be described in greater detail in Section 11.3.4.

11.3.3.1 Landform and Drainage

The study area is contained within a generally flat to low rolling setting. The terrain to the west and south of the site slopes towards the Tolka River valley in a general south-westerly direction, which is situated c. 4km from the site at its nearest point. Whilst several small streams flow throughout the northern and north-western portions of the study area, there are no notable rivers or watercourses within the study area.

11.3.3.2 Vegetation and Land Use

With regard to land use, the study area is a highly modified setting comprising numerous anthropogenic land uses. One of the most prominent of these is the existing Roadstone Huntstown Quarry, which occupies a large area of land to the immediate south of the Proposed Development. The existing Huntstown Power Station, situated approximately 600m southeast of the site boundary, also has a notable influence on the study area due to its relatively large built structures. In contrast to these highly anthropogenic land uses, the proposed site and its immediate surrounds are comprised of areas of pastoral farmland that provide a buffer space within the surrounding industry. Dublin Airport is also located just over 1.6 km east of the site, with the Airport logistics park located just over 700m to the east. The Proposed Development is contained by several major linear transport routes, including the M50 and N2 national primary routes.

The most notable areas of vegetation in the surrounds of the site are the linear corridors of mature hedgerows that define the pastoral fields within the study area, whilst swathes of immature woodland often flank the major routes corridors that contain the site.

Figure 11.5 Landscape Context of central study area



11.3.3.3 Centres of Population and Housing

Due to the highly industrialised nature of this landscape context, there is a limited number of residential receptors in the near surrounds of the site. The nearest residential receptor is situated at the bend of the L3120 local road, approximately 260m northwest of the site boundary. Two dwellings (Bloomburn Cottage, Kilshane, Dublin 11, D11F1W8 and Kilmonan Lodge, Kilshane, Dublin 11, D11 XP89), which are located to the north of Proposed Development along the L3120 are due to be demolished under An Coimisiún Pleanála Case reference: PL06F.321196 / Planning Authority Case Reference: FW24A/0339E. A large housing development can be found approximately 2km to the west of the site at Hollywoodrath.

11.3.3.4 Transport Routes

The immediate context of the site is heavily influenced by a multitude of major road corridors. The N2/ M2 corridor is located some 100m east of the site at its nearest point. This merges into the M50 motorway

to the south of the site, which is located some 2 km from the site boundary at its nearest point. The regional road R135 passes to the east of the site in a general northeast to southwest direction. The local road L3120 (Kilshane Road) passes to the immediate north of the site, before continuing in a southerly direction to the west of the Proposed Development.

11.3.3.5 Tourism, Heritage and Public Amenities

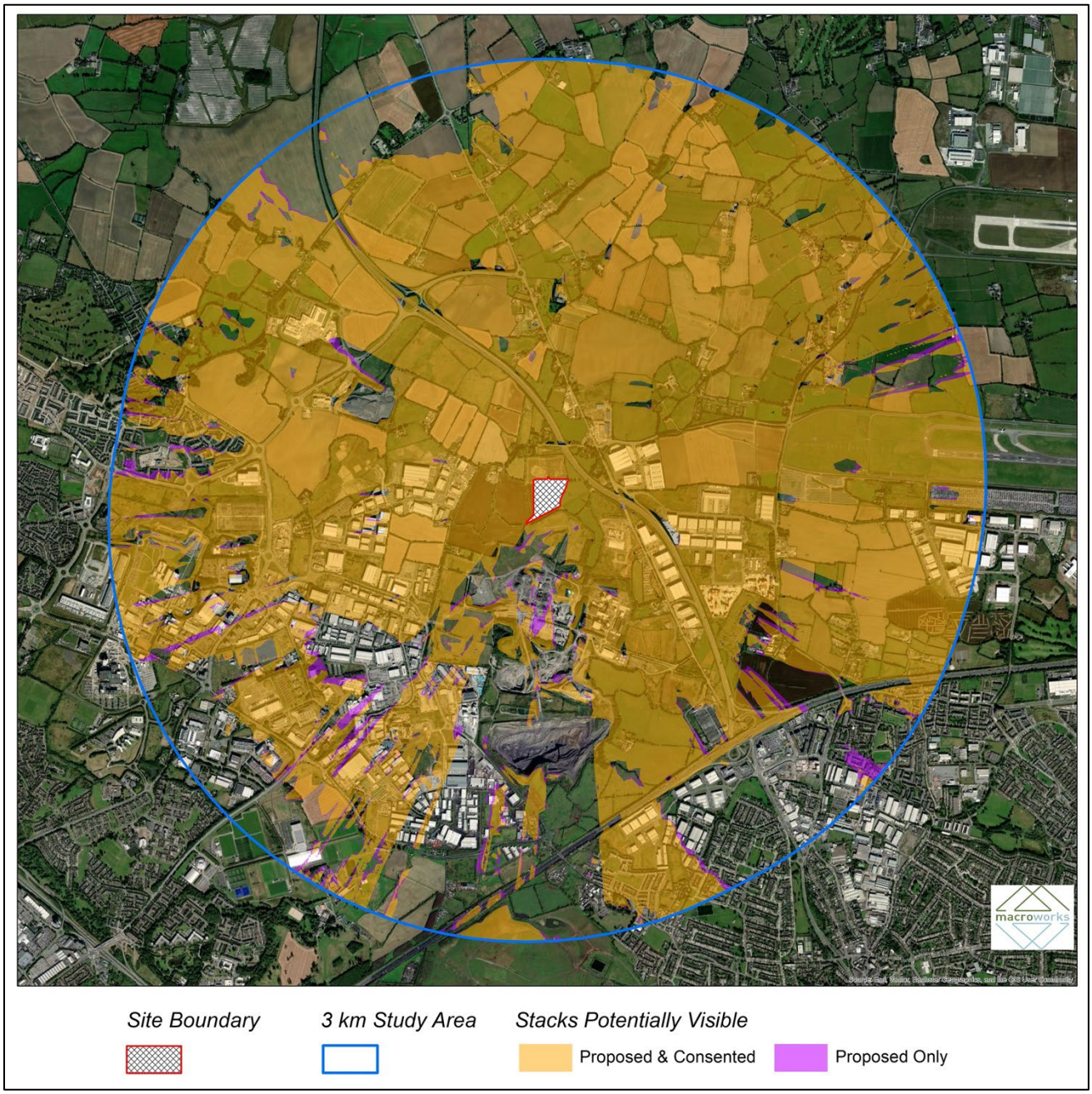
In terms of tourism, heritage and recreation, due to its highly industrialised setting, the study area is not considered to be synonymous with recreation. Dunsoghly Castle, dating to 1450, is located approximately 1 km to the northeast of the site. While managed by the OPW, the castle is not currently accessible to the public. St Margaret's Cemetery is located some 2.3 km northwest of the site. A small pitch and putt golf course is located approximately 1.1 km to the north of the site.

11.3.4 Visual Baseline

11.3.4.1 Analysis of ZTV (Zone of Theoretic Visibility) Mapping

Only those parts of the receiving environment that potentially afford views of the Proposed Development are of concern to this section of the assessment. A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the Proposed Development is potentially visible from. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the Proposed Development will definitely not be visible, due to terrain screening within the 3km study area.

Figure 11.6 Bare-ground ZTV map showing potential visibility of Proposed Development in relation to the permitted development



The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 11.6 above):

- Potential visibility of the Proposed Development is highly similar to that of the permitted development due to the similar nature of the tallest built components and their close proximity to one another.
- A minor increase in potential visibility is noted in the southern extent of the study area however this is limited to brief glimpses, many of which fall within private lands.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. In this regard, the various forms of built development, along with dense layers of intervening mature vegetation around the perimeter and in the immediate surroundings of the site, will result in a considerably reduced degree of visibility.

11.3.4.2 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a Proposed Development in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a Proposed Development is assessed by Macro Works using up to 6 no. categories of receptor type as listed below:

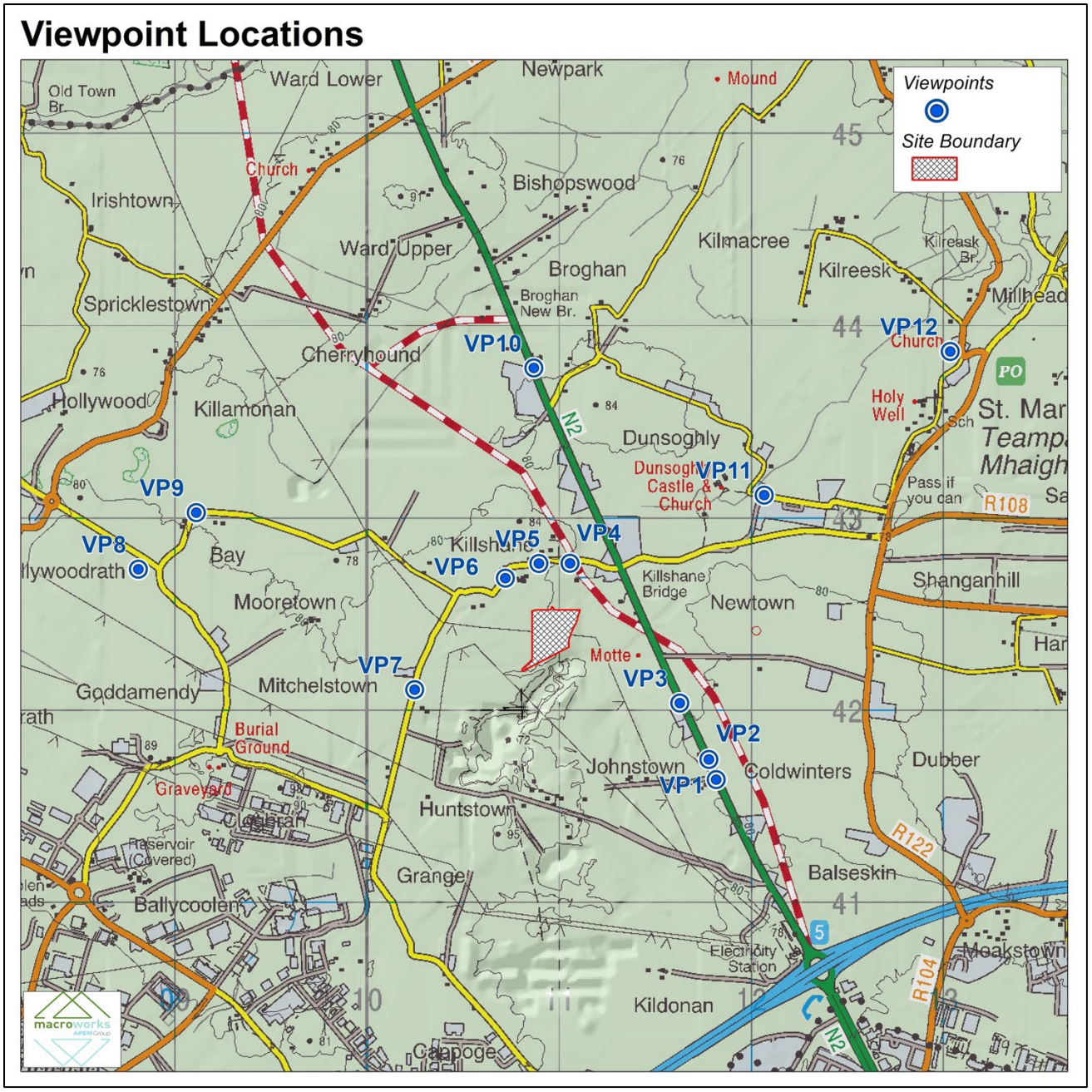
- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR);
- Amenity and heritage features (AH).

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The Viewshed Reference Points selected in this instance are set out in the Table 11.6 and Figure 11.7 below.

Table 11.6 Outline Description of Selected Viewshed Reference Points (VPs)

VP No.	Location	Representative of	Direction of view
VP1	R135 at Coldwinters (1)	LCV	NW
VP2	R135 at Coldwinters (2)	LCV	NW
VP3	R135 at Coldwinters (3)	LCV	NW
VP4	N2 overpass at Kilshane	MR	S
VP5	L3120 at Kilshane (1)	LCV	S
VP6	L3120 at Kilshane (2)	LCV	SE
VP7	L3120 at Huntstown	LCV	NE
VP8	Hollywoodrath Housing Estate	CP	E
VP9	Cherryhound Tyrrelstown Link Road	MR	SE
VP10	R135 at Broghan	AH, LCV	S
VP11	L7231 at Dunsoghly	AH, LCV	SW
VP12	Saint Margaret's Cemetery	AH	SW

Figure 11.7 Viewpoint location Map



11.4 Characteristics of the Proposed Development

A detailed description of the Proposed Development is set out in Chapter 2 of this EIAR (Description of the Proposed Development). The details of the construction and operation of the development in terms of landscape and visual impact are detailed below.

11.4.1 Construction Phase

- Site clearance – clearance of vegetation and regarding of the site for incoming earthen berms. Setting up temporary facilities such as construction offices and storage areas, and establishment of construction fencing and lighting. Large machinery and tower cranes that may rise above intervening vegetation to construct new pylon structures.

- Temporary construction infrastructure – Installation of temporary site fencing, lighting, access and welfare facilities.
- Construction traffic – Increase movement of HGV along the immediate surrounding road network. Additional movement, noise and dust on lands immediately adjacent to the site.
- General emergence of the proposed construction stage activities and proposed structures from the surrounding local and wider landscape.
- Trees and hedgerows to be retained will be protected in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction'.

11.4.2 Operational Phase

- Modification of landform;
- Intensification of consented development within the local and wider landscape and impacts on the surrounding prevailing landscape character;
- Establishment of landscaping proposals within and around the perimeter of the Proposed Development.

11.5 Potential Impacts of the Proposed Development

11.5.1 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the GLVIA3, which are set out below and discussed relative to the Proposed Development site and wider study area.

The landscape of the study area constitutes a highly modified setting influenced by large-scale commercial and industrial developments. The site and its immediate surroundings are heavily influenced by the highly anthropogenic setting of the existing Roadstone Huntstown Quarry and Huntstown Power Station, whilst the active quarry also generates a high degree of HGV traffic along the surrounding road network. A broad expanse of business and technology parks also occurs in the south-western portion of the study area, whilst small industrial and commercial land use clusters also occur to the east of the site and include Dublin Airport Logistics Park and Horizon Logistics Park. Dublin Airport is a prominent land use in the wider study area, the westernmost extents of which occur within the eastern extent of the study area. The study area is also heavily influenced by the varied mix of major routes that contain the site, including the busy M50 motorway, the N2 National Primary Route and several other regional roads.

In terms of landscape designations, the relatively robust and non-distinctive character of the study area is reflected in the Landscape Character Assessment. The site is contained within the southwestern part of the 'Low Lying Agricultural' LCT which is designated a 'Modest' Landscape Value and 'Low' Landscape Sensitivity. The Proposed Development site is also zoned as 'HI-Heavy Industry', which reflects the utilitarian character of this landscape context. The principal zoning objective for this zoning is "*Provide for heavy industry*".

Overall, it is considered that this is an anthropogenic landscape context that is highly influenced by numerous utilitarian land uses and features. The study area is not considered to be highly unique or distinctive with regard to the physical landscape; instead, its character is heavily derived from its highly modified and industrial nature. This is a busy working landscape that encompasses one of the principal major route corridors in and out of the capital. There is no strong sense of scenic or recreational amenities nor is it considered to be highly susceptible to development. On balance of the reasons outlined above, and in accordance with the criteria outlined in Table 11.1, the landscape sensitivity to this form of industrial development is deemed to be **Low**.

11.5.2 Assessment of Receptor Sensitivity – Visual

As a result of its industrial context, views across the majority of the study area present with a high anthropogenic presence. Furthermore, large portions of the study area are visually contained due to dense

roadside hedgerows and mature tree lines, notably along the N2 road corridor. The northern extent of the study area consists of a relatively typical agricultural landscape, with views extending across farmland and stacked hedgerow vegetation. As previously noted, there are no designated scenic routes or views located within the study area. Major routes are prominent features of this landscape context and also tend to be well contained and bound by highly anthropogenic land uses. As such, major routes within the study area tend to be classified with a Medium-low and Low receptor sensitivity, with areas classified as Medium-low less influenced from highly utilitarian built forms and land uses.

Whilst a pleasant pastoral aesthetic is noted throughout some parts of the northern extent of the study area, as noted above, the surrounding local and wider landscape to the south is heavily influenced by an array of anthropogenic features such as major transport routes, urban settlements, and industrial development. Overall, the sensitivity of visual receptors within the more typical working landscape context tends to range between Medium and Medium-low, with those of a Medium sensitivity representing more open views across the wider landscape.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the site are considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 11.2.4, visual receptor sensitivity judgement are provided for each representative viewpoint in the table in section 11.5.6 below.

11.5.3 Magnitude of Landscape Effects – Construction Phase

During the construction phase there will be a far higher intensity of activity at the site than during the operational phase. This will consist of heavy goods vehicle movement to and from the site as well as construction machinery within the site. Nonetheless, the perceived intensification of HGVs is likely to be limited as HGV are a characteristic feature of the surrounding road network due to the presence of the existing Roadstone Huntstown Quarry and other large-scale commercial and industrial development in the surrounding area.

In terms of physical landscape effects, the construction phase of the Proposed Development will result in some notable modifications to the existing landcover and landform to facilitate the Proposed Development. These principally relate to large areas of soil stripping, removal of vegetation and excavation works required to facilitate the foundations of the proposed built elements of the Proposed Development. The larger proposed structures such as the exhaust stacks and air intake units will require some notable excavations and soil stripping, as will the two 12m high acoustic walls.

Construction stage activities are not uncommon in this landscape context which has undergone a high degree of change in the form of various types of development over the past decade. There is a high degree of intervening layers of mature vegetation as well as existing development located in the surroundings of the site, which will notably reduce the perceived effect of the construction stage effects at receptors beyond c. 500m to 1km from the site. Furthermore, construction-related activity and its effect on landscape character will be 'short-term' in duration.

It is considered that the magnitude of construction phase landscape impact is **High-medium** for the Site and its immediate environs, whilst beyond 200-400m it is less likely to be noticed and will have a '**Low**' then '**Negligible**' effect over greater distances as it becomes a proportionately smaller component of the overall hinterland landscape fabric.

With reference to the significance matrix (Table 11.4) above, the **Low** landscape sensitivity judgement attributed to the site and the study area, coupled with a **High-medium** magnitude of landscape impact for the site and its immediate environs, is considered to result in a **Moderate-slight** overall significance of landscape impact within 200-400m of the site. However, beyond approx. 400m from the site, the significance of construction-stage impacts is likely to reduce from **Slight** and **Imperceptible**.

11.5.4 Magnitude of Visual Effects – Construction Phase

During the construction phase, the main visual impacts will arise from the frequent movement of heavy goods vehicles (HGVs) and worker vehicles travelling to and from the site via the designated site entrance. In addition, construction machinery and equipment, some of which may extend above intervening vegetation and existing buildings, will be present within the site. The exhaust stacks and larger structures will likely require tower cranes for their construction, which will likely be visible during the construction phase. The lower lying proposed structures will likely be screened by surrounding vegetation, aside from some elevated areas including the N2 overpass to the north of the site. Stockpiles of stored construction materials will also be visible in certain areas, particularly during peak construction periods. However, aside from the site's immediate vicinity, a large part of this temporary activity within the site will remain screened and partially screened from view by the surrounding land uses and intervening vegetation. Furthermore, construction-related activity is temporary in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are like to result in a visual effect of **Medium** in the immediate surroundings of the site.

Coupled with the **Medium-Low** and **Low** visual receptor sensitivities in the near surrounds of the site, the construction stage visual impacts in the immediate vicinity of the site will be no greater than **Moderate** and **Moderate-slight** and will reduce considerable beyond 500m-1000m from the site, where the Proposed Development will be heavily screened. As a result, construction stage visual impacts are not considered to be significant.

11.5.5 Magnitude of Landscape Effects – Operational Phase

With regard to the landscape character of the site, the Proposed Development will see the introduction of an intensive industrial development across current agricultural land use. Nevertheless, these agricultural fields are situated in an area zoned for heavy industry, with numerous examples of such industry visible throughout the study area. Furthermore, the busy N2/ M2 motorway corridor to the immediate east of the site adds movement and intensity to the central portion of the study area.

Nonetheless, there will be some permanent physical effects to the site's land cover, which are not readily reversible. These relate to the excavation of extensive parts of the site to facilitate the foundations of the buildings and all other infrastructure. Indeed, the Proposed Development will result in the loss of a modest area of agricultural land for a high-intensity energy infrastructure development. Some of the most notable impacts on the local landscape character will be generated from the overall scale of the built aspects of the development, some of which rise to a maximum height of 28m, in addition to the extensive nature of the Proposed Development, which will comprise several different pieces of infrastructure. However, the Proposed Development represents the intensification of the permitted energy development of Kilshane Phase 1 and is situated in an area zoned for such development.

It is also worth noting that the extensive landscaping associated with the permitted Kilshane Phase 1 development will notably offset some of the landscape impacts associated with the Proposed Development. This includes mounded berms and extensive planting of native tree species to the north of the Proposed Development will partially screen views from the L3120 and N2 corridor. The Proposed Development will also utilise an array of contemporary building materials and finishes that move away from the typical industrialised presentation of other older industrial and commercial developments within the wider landscape. This includes light tones on the taller built components such as the air intake units which will reduce the level of contrast when viewed against the sky.

Overall, whilst this is quite a sizable development, it will not appear incongruous in this aforementioned context. Once fully constructed, the Proposed Development will represent a notable increase in the intensity of industrial activities within the immediate surroundings of the site. Nevertheless, it will not appear as an inappropriate form of development, given the industrial nature of the surrounding landscape context.

For the reasons outlined above, it is considered that the magnitude of operational landscape impact is Medium for the site and its immediate environs, whilst beyond approx. 500m it is less likely to be noticed and will have a 'Low' then 'Negligible' effect over greater distances as it becomes a proportionately smaller component of the overall landscape fabric.

With reference to the significance matrix (Table 11.4) above, the **Low** landscape sensitivity judgement attributed to the study area, coupled with a **Medium** magnitude of landscape impact in the immediate vicinity (<500m) of the proposed extension development is considered to result in an overall significance of no greater than **Slight**, with the remainder of the 3km radius study area likely to experience **Slight** or **Imperceptible** landscape impacts.

11.5.6 Magnitude of Visual Effects – Operational Phase

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Baseline view;
2. Imminent Baseline view
3. Outline view (yellow outline showing the extent of the Proposed Development overlaid on the Imminent Baseline view);
4. Montage view

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
VP1	**R135 at Coldwinters (1)**: This view is located along the R135 regional road at a distance of approximately 1km from the site boundary, and is orientated to the northwest. The view is contained at a short distance by large mature trees. The view is representative of local community views along this stretch of road.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent
VP2	**R135 at Coldwinters (2)**: This view is located along the R135 regional road at a distance of c. 900m from the site boundary. Orientated to the northwest, the view is contained at a short distance by stacked layers of vegetation and built development. The view represents the local community view receptor.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation and buildings in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent
VP3	**R135 at Coldwinters (3)**: Again, this view is situated along the R135 regional road. Viewed through a perimeter palisade fence, the view looks across an area of new large-scale development under construction. This view is representative of a number of dwelling houses located along this stretch of road and to the immediate south of this viewpoint. The imminent baseline view includes a partial view of the upper portions of the permitted energy plant structures, rising above mature vegetation in the near distance.	Medium-low	From this location, the Proposed Development is entirely screened by intervening built development. Thus the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
VP4	**N2 overpass at Kilshane (1)**: This viewpoint is situated on the N2 overpass at the townland of Kilshane at a distance of c. 240m from the site boundary. The view represents the major route receptor of the N2 corridor. While screening vegetation along the motorway corridor is generally quite comprehensive, the treeline along this portion of the site is more sporadic. Extraction activity relating to the Roadstone Quarry is clearly visible in the background of the image. The imminent baseline includes a prominent view of the permitted development. The permitted diesel storage tank occupies a prominent position to the fore of the view and will be one of the key built features view from this overpass.	Medium-low	The clearest view of the Proposed Development is afforded from this location due to its locally elevated nature. The exhaust stacks of the two proposed gas turbines are clearly visible, rising to the rear of the permitted structures, in addition to one of the evaporative cooler structures. Viewed in combination with the permitted development, there is a notable increase in built infrastructure in this view, however the Proposed Development will not increase the vertical extent of development within the view. Despite its considerable scale, the Proposed Development is partially screened by existing mature vegetation in its immediate surroundings. It is important to note that in general the N2 corridor is heavily screened by existing vegetation along its length, which will limit views into the site for road users passing adjacent to the site. Furthermore, this view is notably influenced by existing heavy industry, and as such, the introduction of a large-scale energy development does not greatly detract from any sense of scenic amenity in this location. Overall, the magnitude of effect is deemed Medium.	Moderate / Negative / Permanent

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
VP5	**L3120 at Kilshane (1)**: This viewpoint is situated to the north of the Proposed Development, along the L3120 local road. Young / semi-mature roadside trees and vegetation limit the view into the field beyond containing the Proposed Development. The view is representative of local community receptors along the roadway. The imminent baseline includes a partial view of the diesel storage tank of the permitted development, while the majority of the remaining structures are screened by roadside vegetation.	Medium-low	A view is afforded of the upper portions of the development, rising above roadside vegetation. Two evaporative cooler structures and one exhaust stack are visible, while a glimpsed view is afforded of the proposed GIS building. Similar to VP4, the Proposed Development will contribute to an increase in built infrastructure in this location when viewed in combination with the permitted structure. However, the majority of the development is screened by existing roadside vegetation in this view which notably limits its visual presence. Overall, the magnitude of effect is deemed Medium-low.	Moderate-Sight / Negative / Permanent
VP6	**L3120 at Kilshane (2)**: This viewpoint is situated to the northwest of the Proposed Development, along the L3120 local road. As with VP5, this viewpoint is also representative of residential dwelling houses located along this stretch of road. A clear view is afforded across the neighbouring field into the site. Large warehouse buildings to the east of the M2 motorway are visible, rising above the vegetation flanking the motorway, while the upper portions of Huntstown Power Station and several electricity pylons are visible in the background.	Medium-low	Planting measures relating to the permitted development, once fully established, will entirely screen views of the proposed structures from this location. Thus the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
	The imminent baseline view is heavily vegetated once planting measures relating to the permitted development have fully established. A view is afforded of the new road which will bypass this portion of the L2130.			
VP7	**L3120 at Huntstown**: This is a view from a field entrance to the southwest of the Proposed Development. The view looks across tillage farmland and is contained at a short distance by dense hedgerow vegetation with a mature treeline. Excavated mounds associated with the Roadstone Quarry are visible rising above this vegetation. This view is representative of local community receptors along this stretch of road. A partial glimpse of infrastructure associated with the permitted development will be discernible though existing hedgerow vegetation in the imminent baseline view. However, it is unlikely to be noticeable at this viewing distance.	Medium-low	A brief view of the upper portions of the proposed exhaust stacks is afforded from this location. Dense hedgerow containing a mature treeline screens the majority of the Proposed Development. While this is a well vegetated view, it retains a notable anthropogenic presence, with large electricity pylons visible rising above the trees in the near distance. Furthermore, the Proposed Development is viewed well offset from the local road in this location and occupies a limited lateral extent of the view. Overall, the magnitude of effect is deemed Low.	Slight / Negative / Permanent
VP8	**Hollywoodrath Housing Estate**: This viewpoint is situated on the eastern periphery of a new housing estate development. Orientated to the east, the view is contained by a thicket of trees which divide the housing estate from the road corridor. Warehouse buildings can be seen rising above the trees to the southeast. The view is representative of the notable centre of population at Hollywoodrath.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
VP9	**Cherryhound Tyrrelstown Link Road**: This view is taken from along the Cherrywood Tyrrelstown Link Road, c. 1.8km from the site boundary. Stacked layers of hedgerow vegetation and intervening development contain the view at a near distance. The view is representative of the major route receptor.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation and buildings in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent
VP10	**R135 at Broghan**: This view is located alongside the R135 Regional Road, c. 1.25km to the north of the site boundary. The view is contained at a short distance by intervening dwellings and roadside vegetation. The view is representative of local community views from this location as well as the amenity feature of the adjacent pitch and putt golf course to the immediate east of this viewpoint.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation and buildings in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent
VP11	**L7231 at Dunsoghly**: This view is located along a local road adjacent to Dunsoghly Castle. While managed by the OPW, the castle is not currently accessible to the public. The view is orientated to the southwest and is contained at a short distance by stacked layers of hedgerow vegetation in the direction of the site. In addition to the heritage receptor of the castle, the view represents local community views from this location with a notable number of dwelling houses located along this local road.	Medium-low	The Proposed Development will not be visible from here due to the high degree of intervening vegetation and buildings in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent

VP No.	Existing View	VP Sensitivity	Magnitude of Visual Effect	Residual Significance / Quality / Duration of Effect
VP12	**Saint Margaret's Cemetery**: This view looks across the low-rolling agricultural landscape surrounding the cemetery. The surrounding landscape is well vegetated with several mature trees visible throughout. This view represents the amenity and heritage receptor of the cemetery.	Medium	The Proposed Development will not be visible from here due to the high degree of intervening stacked layers of vegetation in the direction of the site. Thus, the magnitude of effect is negligible by default.	Imperceptible / Neutral / Permanent

11.6 Mitigation Measures

11.6.1 Construction Phase

With regard to landscape and visual there are limited construction-stage mitigation measures as the site is well established and heavily screened from surrounding receptors. In this regard, there is no requirement for site hoarding or additional screening to screen the construction stage effects as much of the construction stage works will be heavily screened by the existing surrounding vegetation.

11.6.2 Operational Phase

The main mitigation-by-avoidance measure employed in this instance is the siting of the development in a robust landscape where the zoning aligns and where it is surrounded by other commercial and industrial developments of a similar scale. The Proposed Development will also avail of landscaping and planting measures associated with the permitted development to its immediate north. Indeed, these landscaping measures, which consist of the construction of earthen berms and substantial areas of native planting, will result in a notable visual buffer for the nearest surrounding receptors, particularly those to the west. It should be noted that based on the current proposed timelines for both the consented and proposed projects, the consented landscape will have up to 4 years to establish prior to the projected operational phase of the Proposed Development. These planting measures, combined with the siting of the Proposed Development in a robust area that benefits from a high degree of existing screening, will considerably reduce the perceived presence of the Proposed Development within the surrounding local and wider landscape.

11.7 Monitoring or Reinstatement Measures

11.7.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

All tree protection requirements will be installed on commencement of the development and removed on a phased basis as stages of the development are completed.

11.7.2 Operational Phase

Monitoring during operations will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. All works will be monitored on an ongoing basis to ensure the quality of the development is maintained.

11.8 Cumulative Impacts of the Proposed Development

The main source of cumulative impact with regard to landscape and visual relates to the consented Phase 1 of the Kilshane Gas Turbine Power Generation Station development (FW22A/0204 / PL06F.317480).

In terms of landscape impacts, the combined proposed and permitted developments represent a further intensification of energy infrastructure development in this location. Indeed, the combined developments will constitute one of the most prominent single land uses in this local context. Nonetheless, both the proposed and its neighbouring developments are considered appropriate development types in terms of the current land use zoning and will not appear incongruous in this landscape context that comprises an

array of energy infrastructure and other highly anthropogenic activity of a similar scale and nature such as the Huntstown Power Station to the south.

With regard to cumulative visual effects, the permitted and proposed developments will generally be viewed together and as such perceived as one single development. When viewed form the L3120 and N2 overpass, the permitted structures will largely screen the lower lying elements of the Proposed Development, with only the exhaust stacks and air intake units visible. Furthermore, the proposed and consented developments will benefit from a high degree of existing screening by the surrounding dense vegetation and other built developments. The extensive landscaping associated with the permitted Kilshane Phase 1 development will notably offset some of the visual impacts associated with the Proposed Development. This is most apparent from VP6, where mounded berms and extensive planting of native tree species along the western extent of the permitted development will entirely screen the proposed structures.

In addition to cumulative effects from Kilshane Phase 1, it is noted that the proposed Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that EirGrid will submit an application for a new gridline in due course. While the exact route and design details have yet to be finalised, a preliminary alignment indicates a route along part of the L3120 local road and R135 and R121 Regional Roads to the north of the Proposed Development. As the future grid connection will follow the existing road network and will be buried underground, landscape and visual effects are anticipated to be highly localised. Therefore, no notable cumulative effects are anticipated to arise from this future development.

In summary, whilst there will be a notable intensification of energy infrastructure within the study area should the proposed and permitted developments be realised, it is not considered that there will be any significant cumulative impacts.

11.9 Residual Impacts

11.9.1 Construction Phase

The principal construction stage landscape and visual impacts are associated with the movement of heavy earth-moving machinery and the erection of tower cranes on-site in order to construct the large components of the Proposed Development. In addition, the temporary storage of excavated materials on-site and the gradual emergence of the Proposed Development will also generate landscape and visual impacts. Nevertheless, due to the contained nature of the site and mitigation measures associated with the Kilshane Phase 1 development, it is considered that both construction landscape and visual effects will be heavily diminished.

Overall, the construction stage landscape effect is deemed to be no greater than a Slight significance and Negative in quality, whilst the significance of construction stage visual impacts is deemed to be no greater than Moderate and of a Negative quality in the immediate surrounds of the site. Nonetheless, these impacts will reduce rapidly beyond the immediate site context, which is well contained by both perimeter vegetation and layers of intervening built development within the immediate surrounding landscape. The construction stage landscape and visual effects are classified as 'short-term' in terms of duration. Overall, the residual construction stage effects are deemed ***not significant.***

11.9.2 Operational Phase

In terms of landscape impacts, there will be some permanent physical effects to the site's land cover, which are not readily reversible. These relate to the excavation of extensive parts of the site to facilitate the foundations of the buildings and all other infrastructure. Indeed, the Proposed Development will result in the loss of an area of agricultural land for a high-intensity energy infrastructure development. Nevertheless, these agricultural fields are situated in an area zoned for heavy industry, with numerous

examples of such industry situated throughout the study area. Furthermore, the busy N2/ M2 motorway corridor to the immediate east of the site adds movement and intensity to the central portion of the study area. Overall, whilst this is quite a sizable development, it will not appear incongruous in this aforementioned prevailing modified landscape context.

In terms of impacts on landscape character, the proposed extension development will see the introduction of an intensive industrial development across current agricultural land use. Nevertheless, these agricultural fields are situated in an area zoned for heavy industry, with numerous examples of such industry visible throughout the study area. The Proposed Development represents the intensification of the permitted energy development of Kilshane Phase 1. Once fully constructed, the Proposed Development will represent a notable increase in the intensity of industrial activities within the immediate surroundings of the site. Nevertheless, it will not appear as an inappropriate form of development, given the industrial nature of the surrounding landscape context.

Overall, the Proposed Development does not conflict with landscape and visual policies and objectives within the current Fingal CDP and represents the intensification of energy infrastructure within the local landscape context. As a result, the significance of operational phase landscape effect is deemed Moderate, is of a Negative-Neutral quality and is Permanent in terms of duration. Therefore, the residual landscape effects are deemed ***not significant*.**

In terms of Visual Impacts, the Proposed Development was assessed at 12 no. viewpoint locations throughout the study area, representing a range of viewing angles, distances, and visual receptors. The majority of views were contained in the near and immediate local surroundings of the development, as this is where the most potential for significant visual effects are likely to occur. The sensitivity of visual receptors for all but one viewpoint were deemed Medium-low, which reflects the robust nature of the study area. Medium sensitivity was attributed to VP12, which represents the heritage receptor of Saint Margaret's Cemetery.

In terms of residual visual effects, the significance of the visual effect ranged between Moderate and Imperceptible. Of the 12 viewpoints, 9 were deemed to have a residual visual effect of Imperceptible, which further reflects the contained nature of the site. The most notable residual effects will occur along the local road L3120 to the north of the proposed site. Indeed, whilst visibility from this local road is heavily contained in some areas, it also affords some open views of the Proposed Development. Viewpoint VP4 affords one of the clearest and nearest views of the Proposed Development, as a result of its elevated location where the L3120 crosses the N2 corridor. The upper portions of the exhaust stacks are clearly visible rising beyond the permitted development. Viewed in combination with the permitted development, there is a notable increase in built infrastructure in this view. However, despite its considerable scale, the Proposed Development is contained within the existing field pattern and is partially screened by existing mature vegetation in its immediate surroundings. Furthermore, this view is notably influenced by existing heavy industry, and as such, the introduction of a large industrial development does not greatly detract from any sense of scenic amenity in this location. Overall, the residual significance of effect was deemed 'Moderate' for this viewpoint.

On balance of the reasons set out above and within the visual impact appraisal, residual visual effects are in the lower order of magnitude as the development tends to be well screened and where visible, will not detract notably from the prevailing robust industrial character of the surrounding landscape. Thus, it is assessed that residual operational phase visual effects generated by the Proposed Development are ***not significant*.**

11.10 References

- Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

Chapter 12 – Archaeological, Architectural and Cultural Heritage

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12. ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

12.1 Introduction

The following chapter assesses the predicted impacts of the Proposed Development on archaeological, architectural and cultural heritage. The Proposed Development is located in the townland of Kilshane, Co. Dublin (ITM E. 710914m, N. 742416m; see Figure 12-1).

Archaeological heritage generally refers to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD1700 and usually recorded as archaeological sites within the Record of Monuments and Places. Archaeological heritage encompasses known archaeological monuments, areas of archaeological potential and underwater archaeology. The term architectural heritage applies to structures, buildings, their contents and setting of an (assumed) age, typically younger than 1700 CE. Architectural heritage includes designated architectural heritage and other significant architectural heritage. Cultural heritage is applied to other aspects of the landscape such as historical events, folklore and cultural associations and can accompany archaeological and architectural designation.

In order to inform the likely significant effects from an archaeological, architectural and cultural heritage perspective, a study area was established measuring approximately 1.5 km from the red line boundary, with reference to sites and historical events from farther afield where appropriate for context. While there is no professional standard for defining the extent of a study area when assessing the possible effects on archaeological, architectural, cultural or protected heritage remains the following was applied based on professional experience.

Where appropriate, mitigation measures to limit likely significant effects to the cultural heritage are documented and, thereafter, residual effects are identified and assessed.

12.2 Methodology

12.2.1 Forecasting Methods

Archaeological, architectural and cultural heritage have been assessed in line with best practice at a National and EU level, in line with the following:

12.2.1.1 Guidelines and Legislation

The following legislation, standards and guidelines were consulted as part of the assessment:

- The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023;
- The Planning and Development Act, 2000 (as amended);
- Heritage Act, 1995 (as amended);
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the Information to be contained in Environmental Impact Assessment Report 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.
- Archaeology in the Planning Process; Office of the Planning Register Planning Leaflet 13 (Dept of Housing, Local Government and Heritage publication 2022)
- Code of Practice between Bord Gáis Ireland and the Department of the Environment, Heritage and Local Government.

12.2.1.2 The Valletta Convention

The Valletta Convention was adopted on 16 January 1992 in Valletta (Malta) and came into force on 25 May 1995 (Council of Europe Treaty Series no. 143). It is open for signature by member states of the Council of Europe and other states party to the European Cultural Convention and for accession by non-member states and the European Community.

The Valletta Convention (The European Convention for the Protection of the Archaeological Heritage (revised)) replaced and updated the original London Convention of 1969. It reflected the change in the nature of threats to the archaeological heritage, which now came less from unauthorised excavations, as in the 1960s, and more from the major construction projects carried out all over Europe from 1980 onwards. The revised Convention drew on twenty-two years of experience in implementing the original Convention. It established a body of new basic legal standards for Europe, to be met by national policies for the protection of archaeological assets as sources of scientific and documentary evidence, in line with the principles of integrated conservation.

12.2.1.3 Assessment Methodology

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. A study area of approximately 500m from the Proposed Development was assessed, with reference to important relevant findings farther afield.

12.2.1.4 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[1]. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, the field notes of the Archaeological Survey of Ireland and other relevant publications. Sites recorded on the Record of Monuments and Places all receive statutory protection under the National Monuments Act 1994. The information contained within the RMP is derived from the earlier non-statutory Sites and Monuments Record (SMR); some entries, however, were not transferred to the statutory record as they refer to features that on inspection by the Archaeological Survey were found not to merit inclusion in that record or could not be located with sufficient accuracy to be included. Such sites however remain part of the SMR. The record is a dynamic one and is updated so as to take account of on-going research. The Record of Monuments and Places was consulted in the Archives of the Department of Arts, Heritage and the Gaeltacht. The recorded archaeological monuments in the study area are shown in Figure 12-1, detailed in Appendix 12.1 and listed in Table 12-1.

12.2.1.5 Recorded Archaeological Objects

The National Museum of Ireland's topographical files are a national archive of all known archaeological finds from Ireland. They relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous excavations. The topographical files were consulted to determine if any archaeological artefacts had been recorded from the cumulativerea. Other published catalogues of

[1] https://www.archaeology.ie

prehistoric material were also studied: Iron Age antiquities[2]; bronze swords, Bronze Age hoards and goldwork[3];bronze axes, halberds and daggers[4].

12.2.1.6 Recorded Archaeological Excavations

The excavation bulletin website[5] 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 2024. The study area has been subject to twelve development led Licensed excavations, or which seven uncovered archaeological remains. Summaries of excavations within the study area are detailed in Appendix 12.2 (see also Table 12-2 and Figure 12-2).

12.2.1.7 Recorded Archaeo-Geophysical Surveys

The Heritage Maps website[6] was consulted to identify previous archaeo-geophysical surveys that have been carried out within the study area. This database contains links to scans of geophysical survey reports undertaken in the county of Dublin. The surveys within the study are area shown on Figure 12-2, listed in Table 12-3 and summarised in Appendix 12.3.

12.2.1.8 National Inventory of 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[7]. The Minister for Housing, Local Government and Heritage is currently using the Inventory as the basis for making recommendations for the inclusion of structures in the Record of Protected Structures (RPS).

The Fingal County Development Plan 2023 – 2029 was consulted[8]. The plan includes policy objectives for the protection of the county's architectural heritage through their inclusion in the Record of Protected Structures (RPS) or in Architectural Conservation Areas (ACA)[9]. The RPS is a list of every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the council's functional area. Sites listed in the Record of Protected Structures within the study area are listed in Table 12-3 and shown in Figure 12-3.

12.2.1.9 Cartographic Sources

Down Survey - Taken in the years 1656-1658, the Down Survey of Ireland is the first ever detailed land survey on a national scale anywhere in the world. The survey, led by William Petty, 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[10]. The Down Survey map of the County of Dublin and the Barony of Castleknock are shown in Figure 12-4.

Rocque's Map - John Rocque (c.1705–62) was a cartographer and engraver of European repute, who could count among his achievement's maps of London, Paris, Berlin and Rome. Rocque's Irish work

[2] Raftery, B., 1983. A catalogue of Irish iron age antiquities. Marburg.
[3] Eogan, G. 1965. A catalogue of Irish Bronze swords. Dublin: Stationery Office.; Eogan, G. 1983. Hoards of the Irish Later Bronze Age. Dublin: University College Dublin.; Eogan, G. 1994. The Accomplished Art, Gold and Gold working in Britain and Ireland during the Bronze Age. Oxford: Oxbrow Books.
[4] Harbison, P. 1968. Catalogue of Irish Early Bronze Age associated finds containing copper or bronze. Proceedings of the Royal Irish Academy 67C, 35-91.; Harbison, P. 1969a. The daggers and the halberds of the Early Bronze Age in Ireland. Prähitorische Bronzefunde, Abteilung VI, Band 1. C.H. Munich: Beck.; Harbison, P. 1969b. The axes of the Early Bronze Age in Ireland. Prähitorische Bronzefunde, Abteilung IX, Band 1. Munich.
[5] https://www.excavations.ie; https://www.heritagemaps.ie
[6] https://www.heritagemaps.ie
[7] https://www.archaeology.ie; https://www.buildingsofireland.ie
[8] https://www.fingal.ie/development-plan
[9] https://www.arcgis.com/apps/webappviewer/index.html
[10] https://www.downsurvey.tchpc.tcd.ie/

between 1754 and 1760, included a remarkable series of c.170 manuscript estate maps for the earl of Kildare, and a range of commercially driven projects that resulted in finely-engraved and printed surveys of the cities of Dublin[11] (see Figure 12-5).

Ordnance Survey Early Editions - Reference to cartographic sources provides information on the development of the area. Manuscript maps consulted included the Ordnance Survey first edition 6" (1829-41), second edition 25" (1897-1913)[12] and last (1830s-1930s) maps were also assessed (see Figure 12-6, Figure 12-7 and Figure 12-8).

12.2.1.10 Aerial Photography

Available online sources for aerial photography were consulted, including the Ordnance Survey[13] and National Monuments Service[14] collections, Heritage Maps[15], and Google Maps[16] (see Figure 12-9 (1995), Figure 12-10 (2013-2018) and Figure 12-11 (Google Maps)).

12.2.1.11 Historical Research

The baseline historical research utilised sources including Lewis' Topographical Dictionary of Ireland[17], the Urban Archaeological Survey Part VIII: County Dublin[18], the Proceedings of the Royal Irish Academy and the Journal of the Royal Society of Antiquaries.

12.2.1.12 Recent Archaeological Investigations

A review of previous archaeological investigations at the site, including geophysical survey undertaken by J.M. Leigh Surveys Ltd. (License no. 22R0092) and archaeological testing and excavation undertaken by Gahan and Long (License no. 22E0306) was undertaken (see Figure 12-12).

12.2.1.13 Difficulties Encountered During the Study

No difficulties were encountered during the study.

[11] Https://www.dublinhistoricmaps.ie/maps/1600-1799/index.html
[12] https://www.heritagemaps.ie
[13] https://www.osi.maps.arcgis.com/apps/webappviewer/index.html
[14] https://www.archaeology.ie
[15] https://www.heritagemaps.ie
[16] https://www.google.com/maps
[17] Lewis, S. 1837. A Topographical Dictionary of Ireland, 2 Vols. London
[18] Bradley and King, unpublished. The Urban Archaeological Survey Part VIII: County Dublin

Table 12-1. Recorded Archaeological Sites

SMR No	Townland	Monument Class
DU014-001----	Kilshane	Castle - motte
DU014-005001-	Dunsoghly	Castle - tower house
DU014-005002-	Dunsoghly	Chapel
DU014-005003-	Dunsoghly	Castle - motte and bailey
DU014-005004-	Dunsoghly	House - indeterminate date
DU014-005005-	Dunsoghly	Crucifixion plaque
DU014-005006-	Dunsoghly	House - 16th/17th century
DU014-006001-	Newtown (Coolock By., Finglas Ed)	Ringfort - unclassified
DU014-006002-	Newtown (Coolock By., Finglas Ed)	Ringfort - unclassified
DU014-007----	Newtown (Coolock By., Finglas Ed)	Enclosure
DU014-012001-	Kilshane	Church
DU014-012002-	Kilshane	Burial ground
DU014-012003-	Kilshane	Ritual site - holy well
DU014-013----	Newtown (Coolock By., Finglas Ed)	Castle - motte and bailey
DU014-015----	Coldwinters (Castleknock By.)	Ring-ditch
DU014-016----	Coldwinters (Castleknock By.)	Enclosure
DU014-048----	Kilshane	Burial ground
DU014-093----	Kilshane	Enclosure
DU014-094----	Broghan	Habitation site
DU014-097----	Newtown (Coolock By., Finglas Ed)	Ringfort - unclassified
DU014-100----	Newtown (Coolock By., Finglas Ed)	Ring-ditch
DU014-134----	Newtown (Coolock By., Finglas Ed)	Ring-ditch
DU014-135----	Newtown (Coolock By., Finglas Ed)	Ring-ditch
DU014-138----	Johnstown (Castleknock By., Blanchardstown Ed)	Earthwork
DU014-141----	Newtown (Coolock By., Finglas Ed)	Ring-ditch

Table 12-2. Recorded Archaeological Excavations

License #	Townland	Site type	Period/Dating
E440	Kilshane	Cemetery	Early Medieval (AD 400-AD 1099)
1998:18	Kilshane	Burial ground	Undetermined
99E0028	Newtown Link Road, St Margaret's	Cultivation ridges	Medieval (AD 400-AD 1600)
99E0220	Kilshane	Structure	Modern (AD 1750-AD 2000)
00E0043	Brownsbarn–Kilshane	Miscellaneous	Multi-period
01E1214	Newtown	No archaeology found	N/A
01E1214 ext.	Newtown	Ditch	Undetermined
02E1353	Finglas–Ashbourne	Ditch	Undetermined
02E1353	Raystown	Ditch	Undetermined
02E1353 ext.	Coldwinters (Test Area 1)	No archaeology found	N/A
02E1353 ext.	Coldwinters	No archaeology found	N/A
03E1359 ext.	Kilshane	Causewayed enclosure, Habitation site and Cremation pit	Prehistoric (12700 BC-AD 400)
03E1450	Coldwinters	No archaeology found	N/A
03E1450 ext.	Newtown	Burnt spread	Undetermined
04E0807	Newtown Motte, Kilshane	Burnt mound	Undetermined
04E1191	Kilshane	No archaeology found	N/A
05E0236	Coldwinters	Excavation - miscellaneous	Modern (AD 1750-AD 2000)
05E0236	Coldwinters/ Newtown	No archaeology found	N/A
07E1147	Tyrrellstown to Cherryhound	Kiln, Ring-ditch, Cremation pit and Field system	Multi-period
17E0220	St. Margaret's Road	No archaeology found	N/A
17E0285	Coldwinters	Enclosure and Cremated remains	Undetermined
17E0436	Coldwinters	Structure and Kiln - corn-drying	Multi-period
17E0436	Coldwinters	Structure and Kiln	Undetermined
17E0436 ext.	Coldwinters	Structure and Kiln - corn-drying	Medieval (AD 400-AD 1600)
17E0569	Fingal	Ringfort - unclassified	Multi-period
17E0569 ext.	Fingal	Ringfort - unclassified and Burial	Early Medieval (AD 400-AD 1099)
17E0570	Fingal	Ringfort - unclassified	Early Medieval (AD 400-AD 1099)
18E0073	Fingal	Ringfort - unclassified	Early Medieval (AD 400-AD 1099)
18E0357	Ballycoolin	No archaeology found	N/A
22E0348	Kilshane	Enclosure	Medieval (AD 400-AD 1600)
22E0536	Kilshane	Three possible early medieval enclosures	Early Medieval (AD 400-AD 1099)

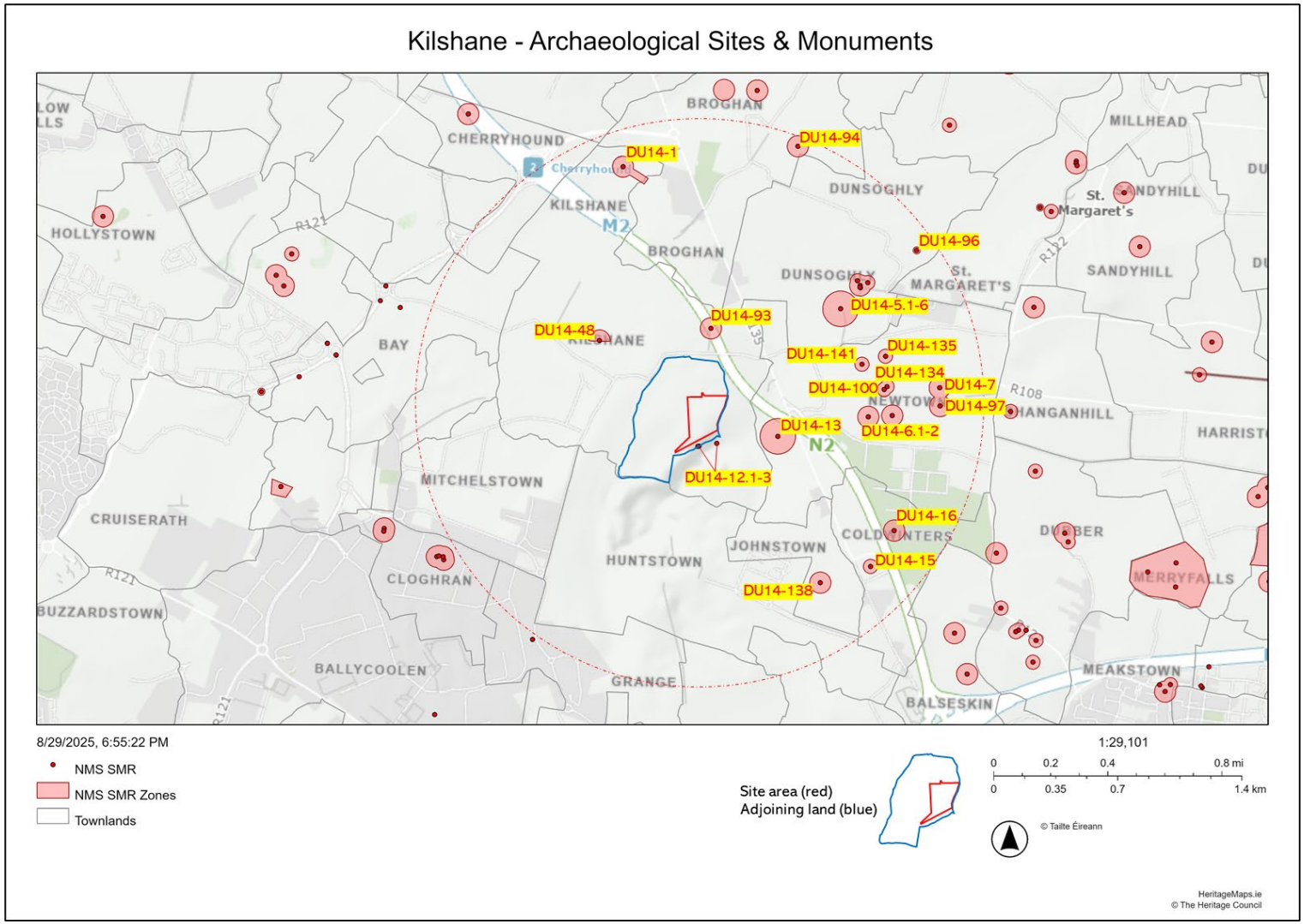
Table 12-3. Recorded Archaeo-Geophysical Surveys

License #	Location	Site type
07R0093	Cherryhound Interchange	Enclosure
08R0017	Tyrrelstown To N2 (Cherryhound Interchange) Link Road	possible Fulacht fiadh
10R0033	Dunsoghly Castle	Ditches, hearth/kiln, possible settlement features
22R0059	Kilshane	Enclosure
22R0092	Kilshane	Enclosure
22R0201	Kilshane	several curvilinear enclosures, linear ditches, a curving double ditch-type feature, areas of burning, pits and additional anomalies

Table 12-4. Record of Protected Structures

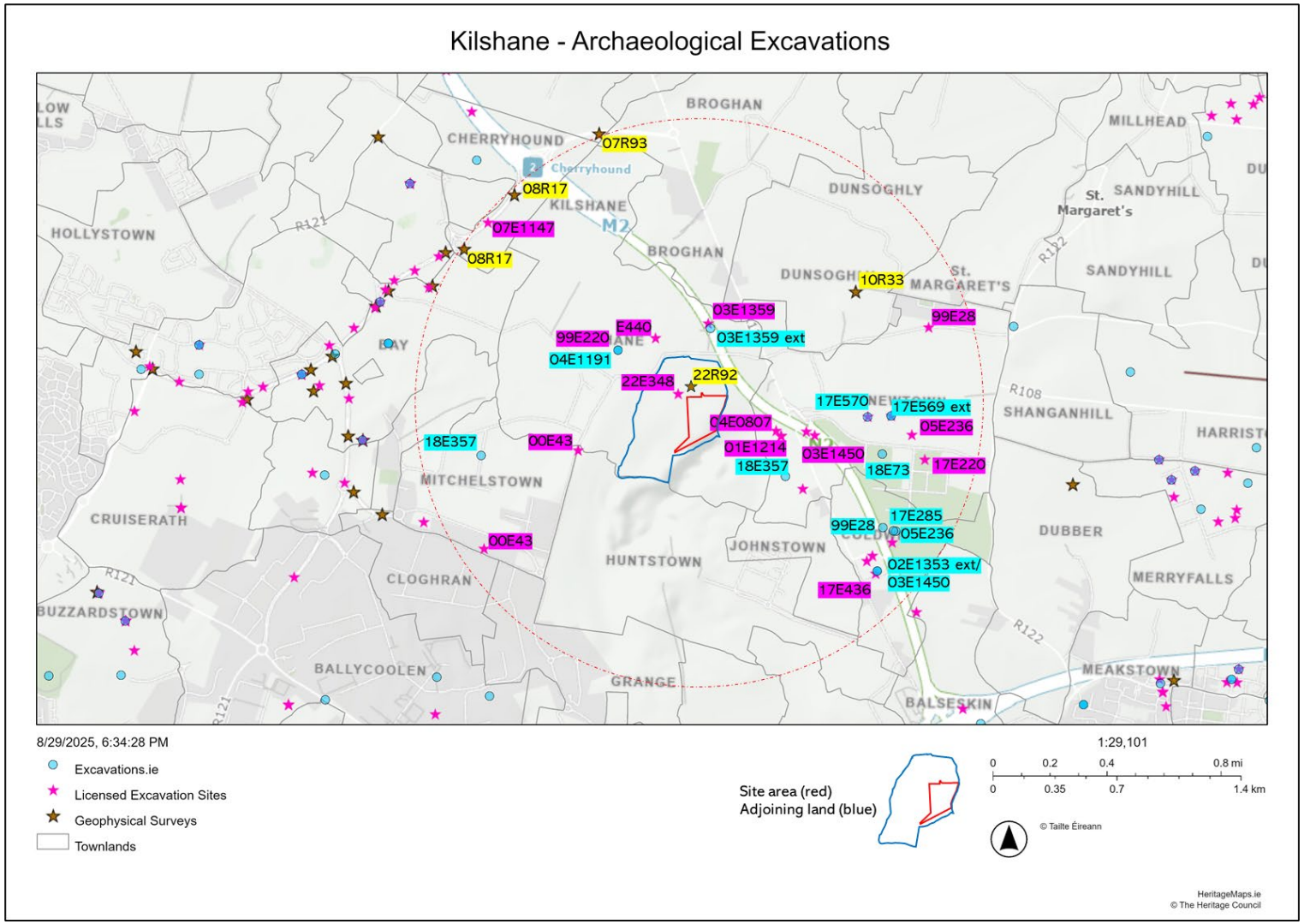
RPS #	Name	In Use As	Description
0623	Castle	Dunsoghly	Intact four-storey 15th century square tower house with large square corner towers (SMR no. DU014-005001-)
0662	Moat	Kilshane	Archaeological site of levelled Anglo-Norman motte (SMR no. DU014-001----)
0865	Motte & Bailey	Dunsoghly	Archaeological site of man-made mound forming part of an Anglo-Norman defended residence known as a motte and bailey castle (SMR no. DU014-005003-)

Figure 12-1. Site location map showing townlands and archaeological sites and monuments, in the vicinity of the Proposed Development[19]



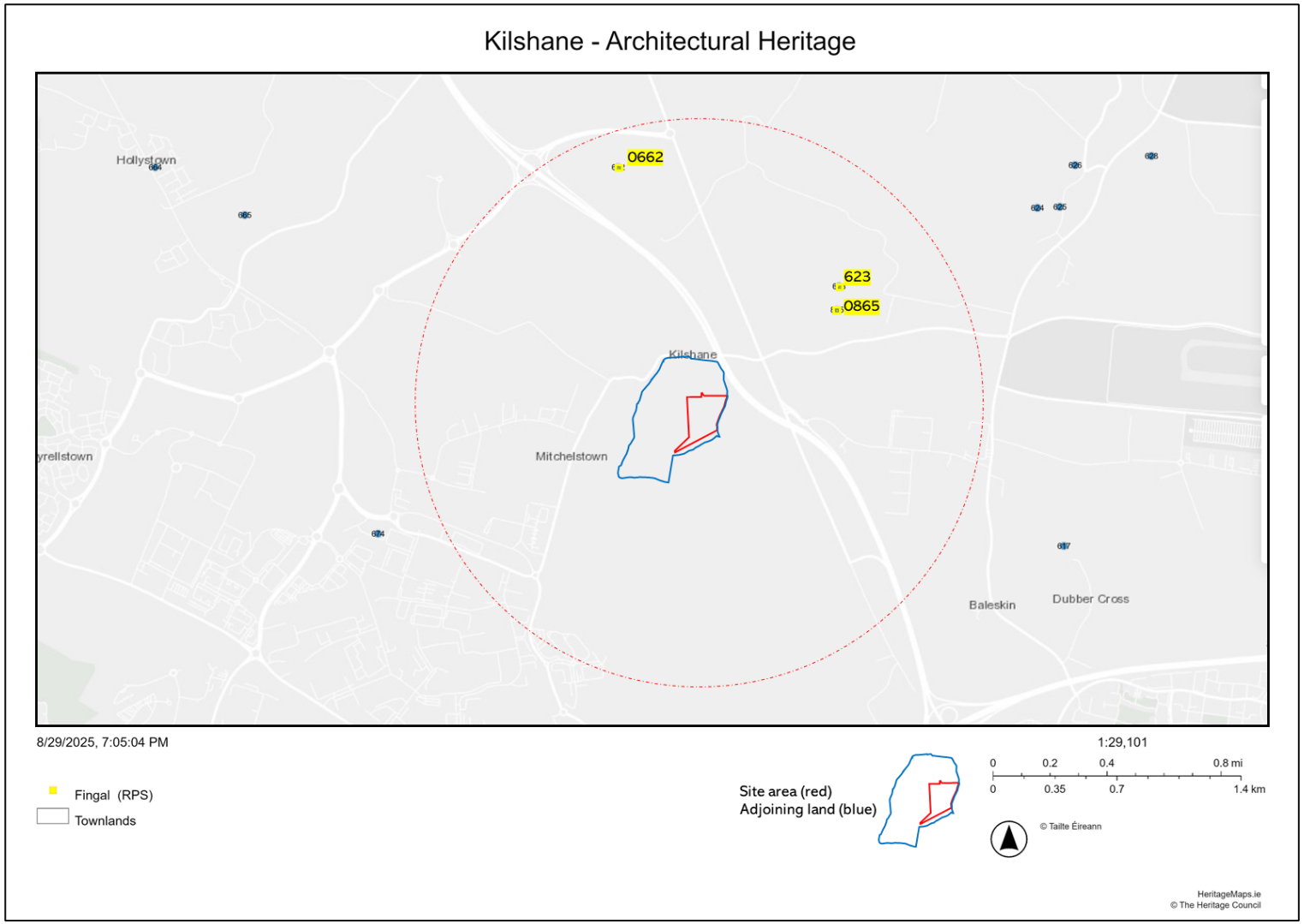
[19] https://www.heritagemaps.ie

Figure 12-2. Site location map showing licensed archaeological investigations in the vicinity of the Proposed Development[20]



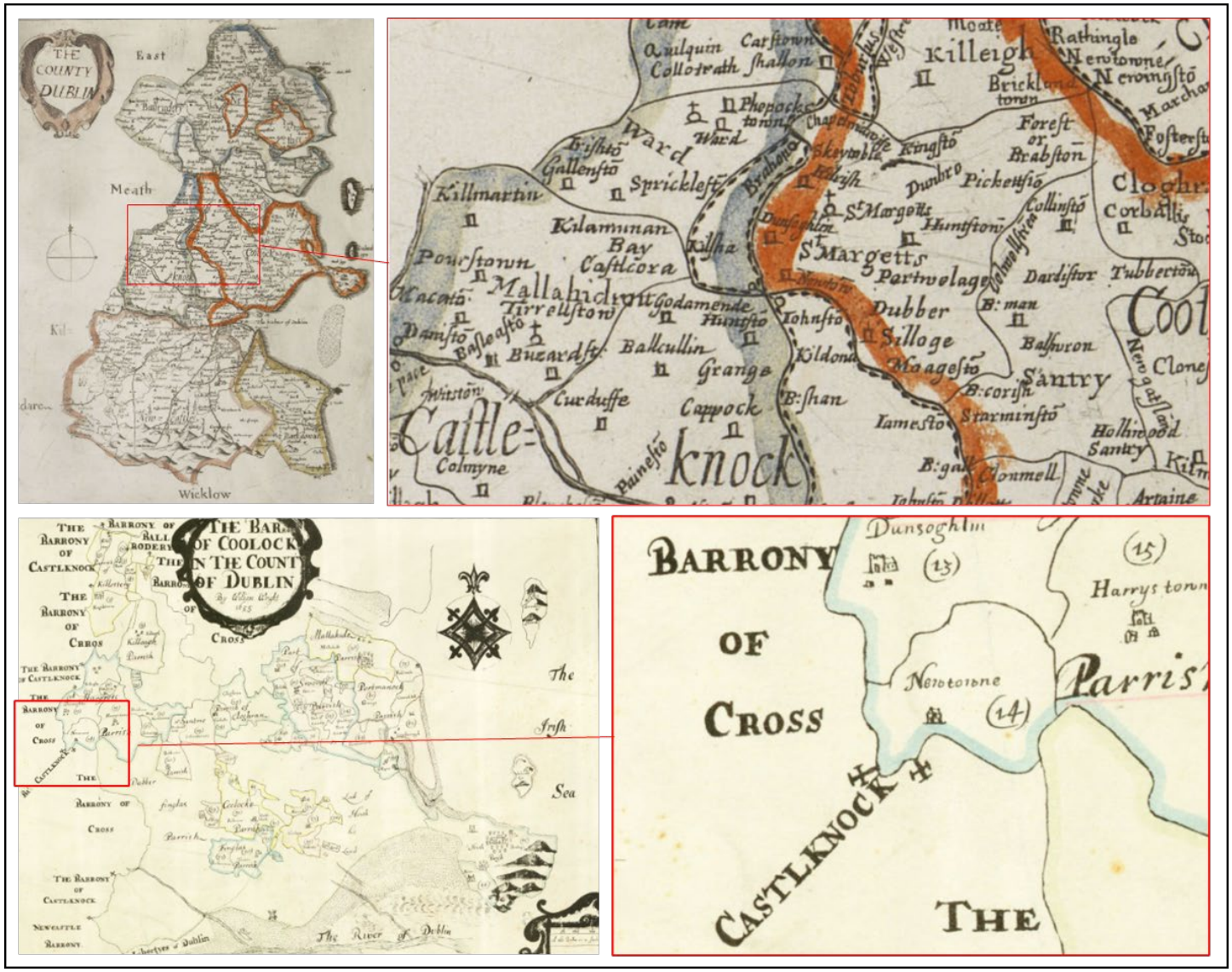
[20] https://www.heritagemaps.ie

Figure 12-3. Site location map showing architectural heritage sites in the vicinity of the Proposed Development[21]



[21] https://www.heritagemaps.ie

Figure 12-4. Extracts from Down Survey[22] maps of the County of Dublin and the Barony of Coolock



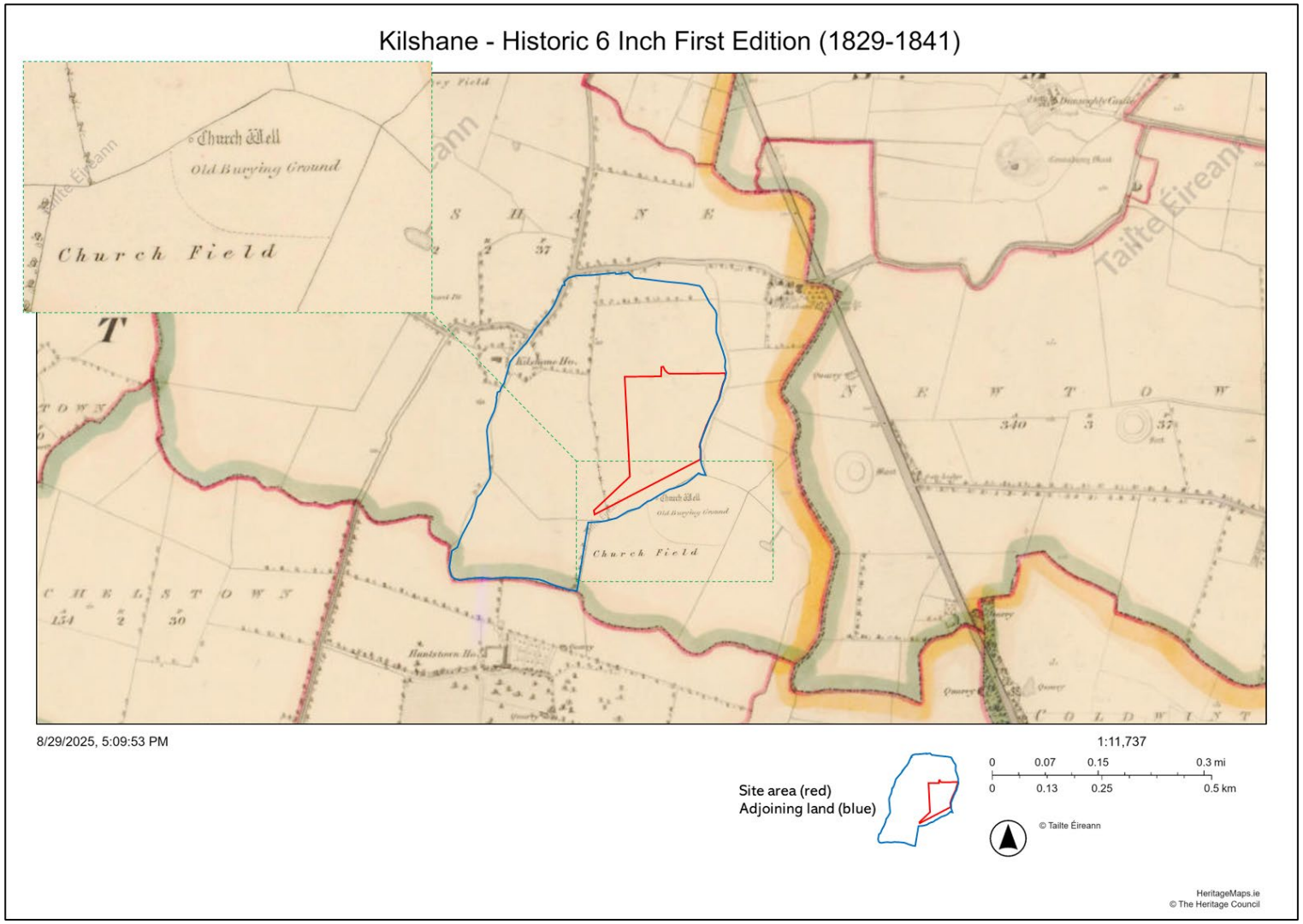
[22] https://www.downsurvey.tchpc.tcd.ie/

Figure 12-5. Extract from John Rocque's map of Southwest Dublin[23]



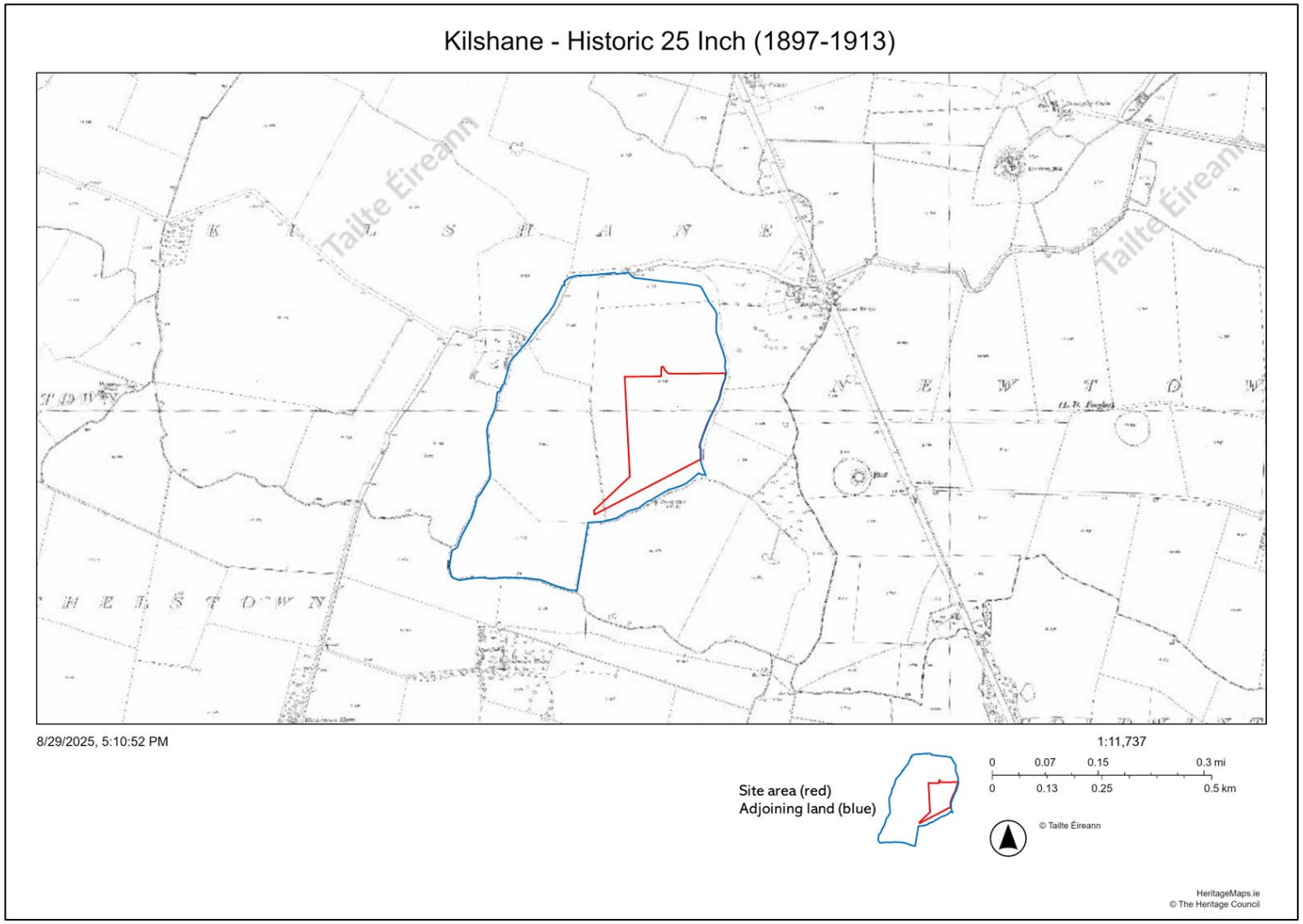
[23] Https://www.dublinhistoricmaps.ie/maps/1600-1799/index.html

Figure 12-6. Extract from the 6 inch first edition Ordnance Survey Map (1830s)[24]



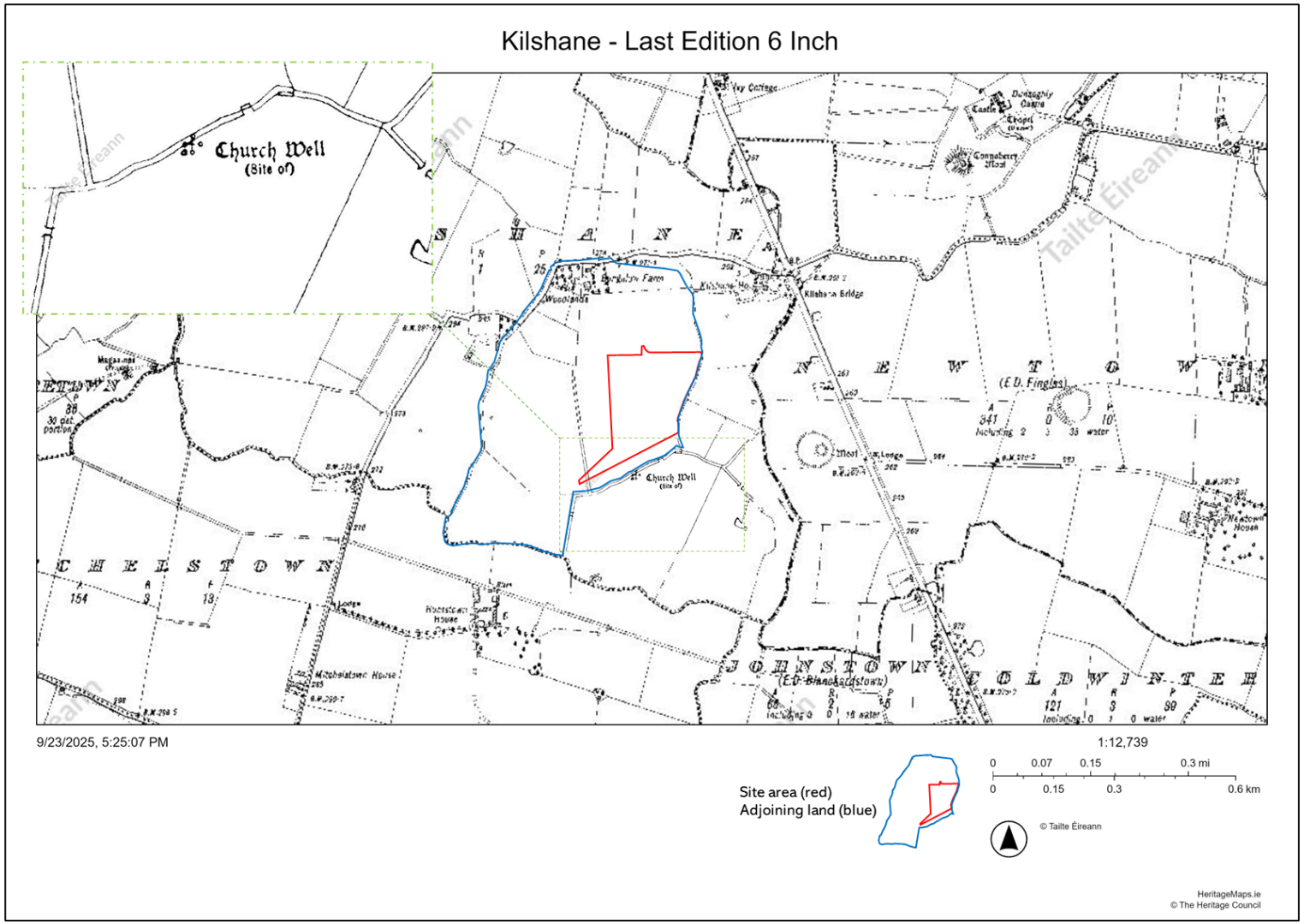
[24] https://www.heritagemaps.ie

Figure 12-7. Extract from the 25 inch edition Ordnance Survey Map (1910s)[25]



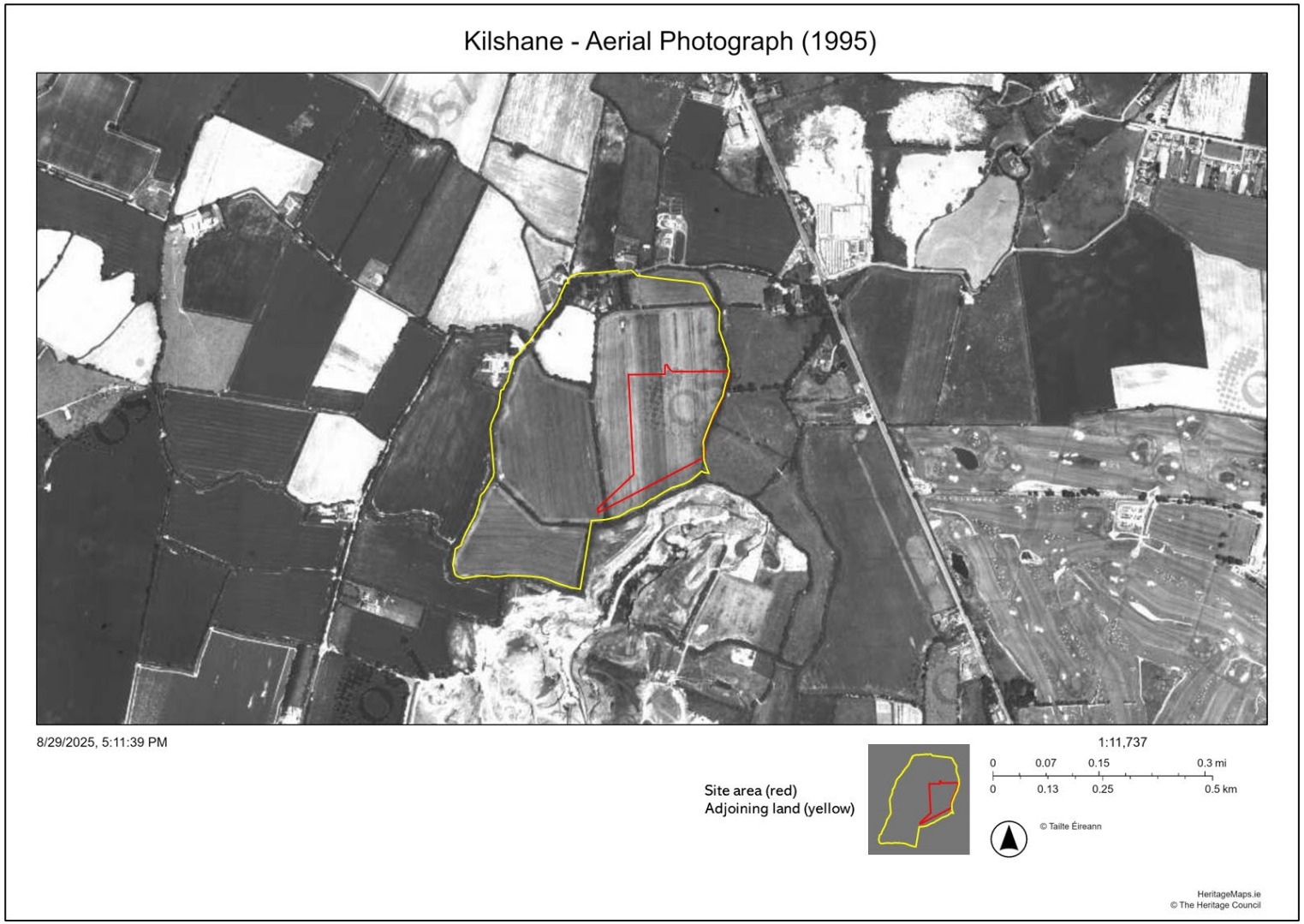
[25] https://www.heritagemaps.ie

Figure 12-8. Extract from the 6 inch last edition Ordnance Survey Map (1830s-1930s)[26]



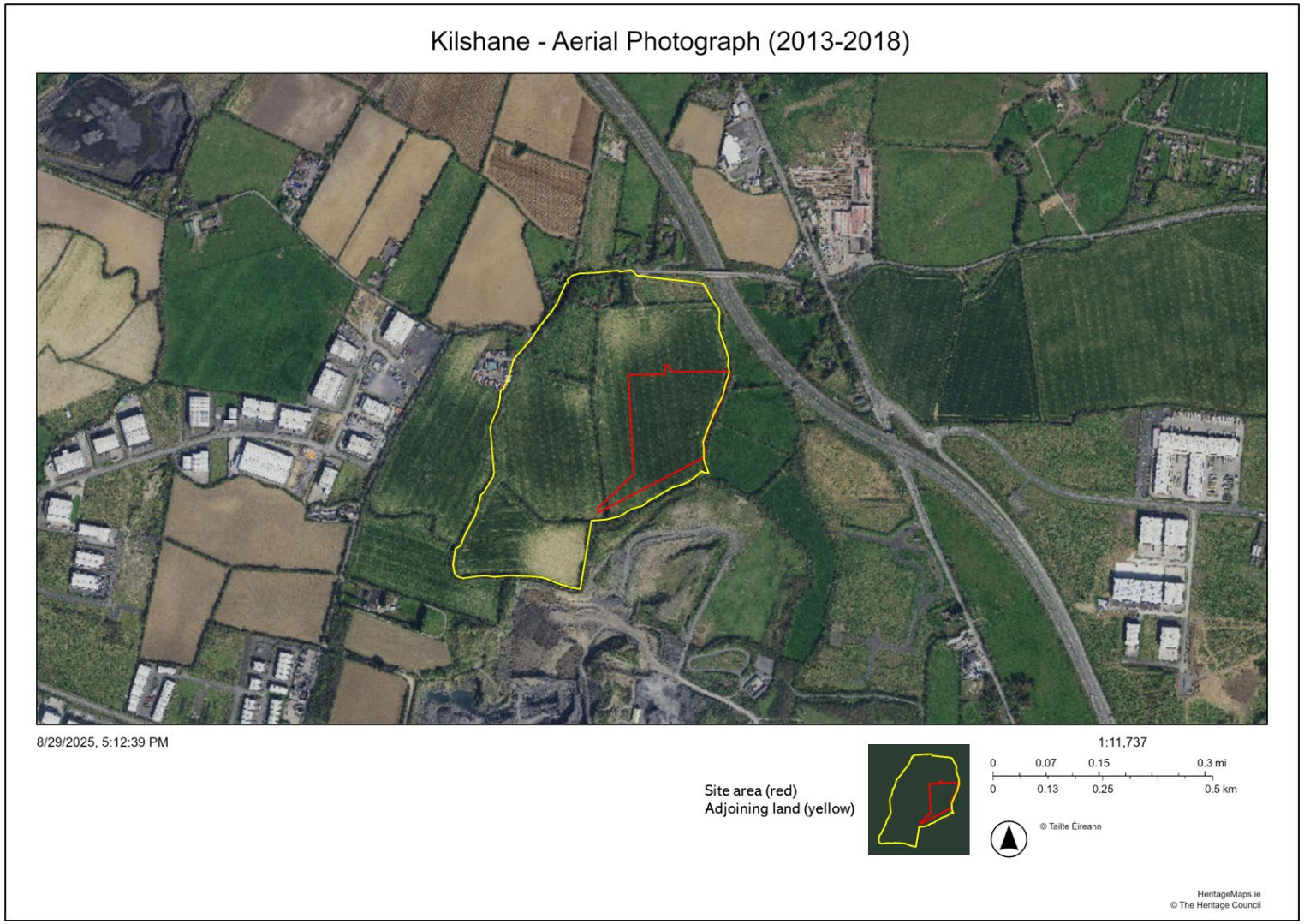
[26] https://www.heritagemaps.ie

Figure 12-9. Extract from aerial photograph of the area (1995)[27]



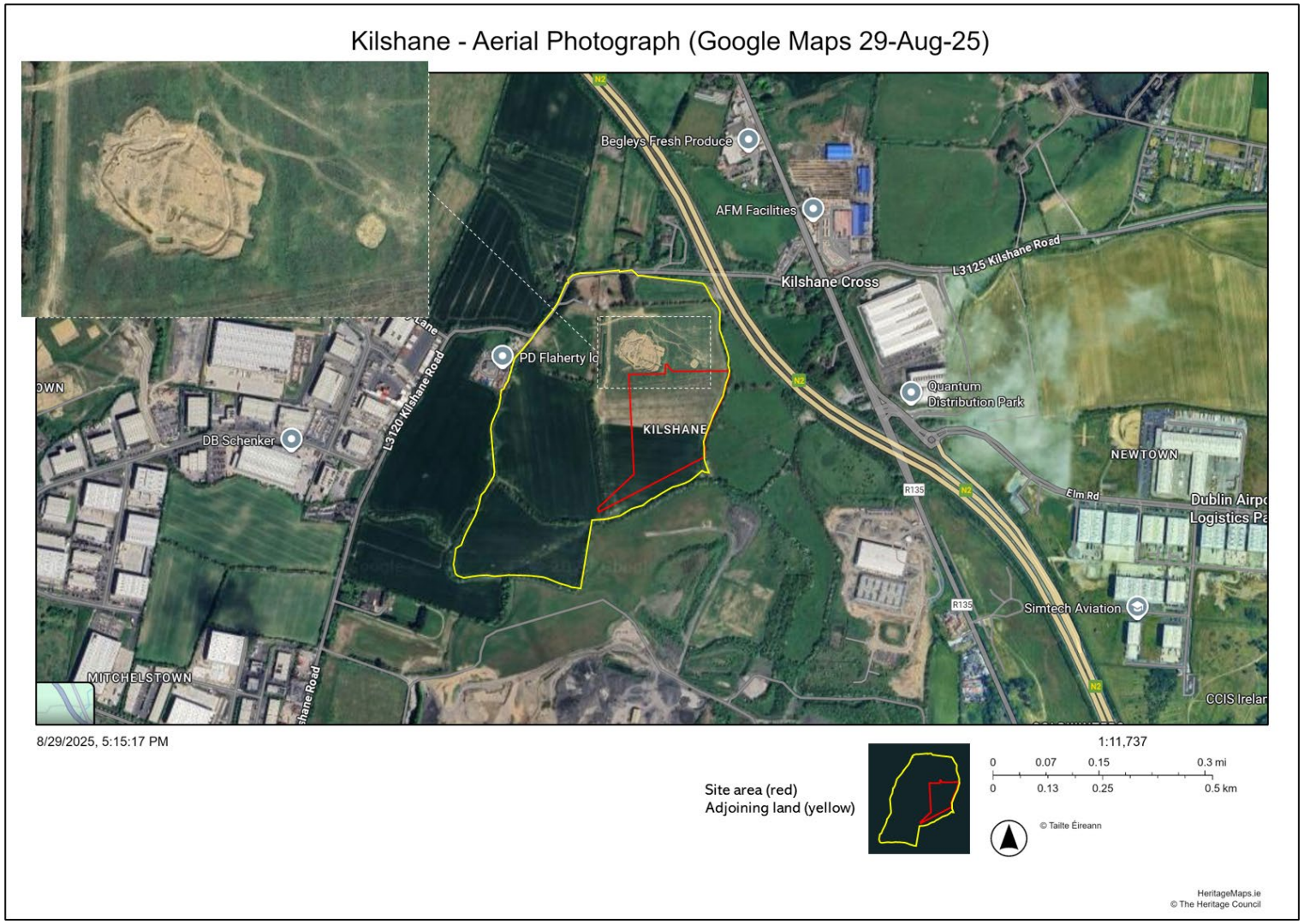
[27] https://www.heritagemaps.ie

Figure 12-10. Extract from aerial photograph of the area (2013-2018)[28]



[28] https://www.heritagemaps.ie

Figure 12-11. Extract from aerial photograph of the area (Google Maps)[29]



[29] https://www.google.com/maps

Figure 12-12. Summary of findings of geophysical survey (22R092) and archaeology testing (22E0348)

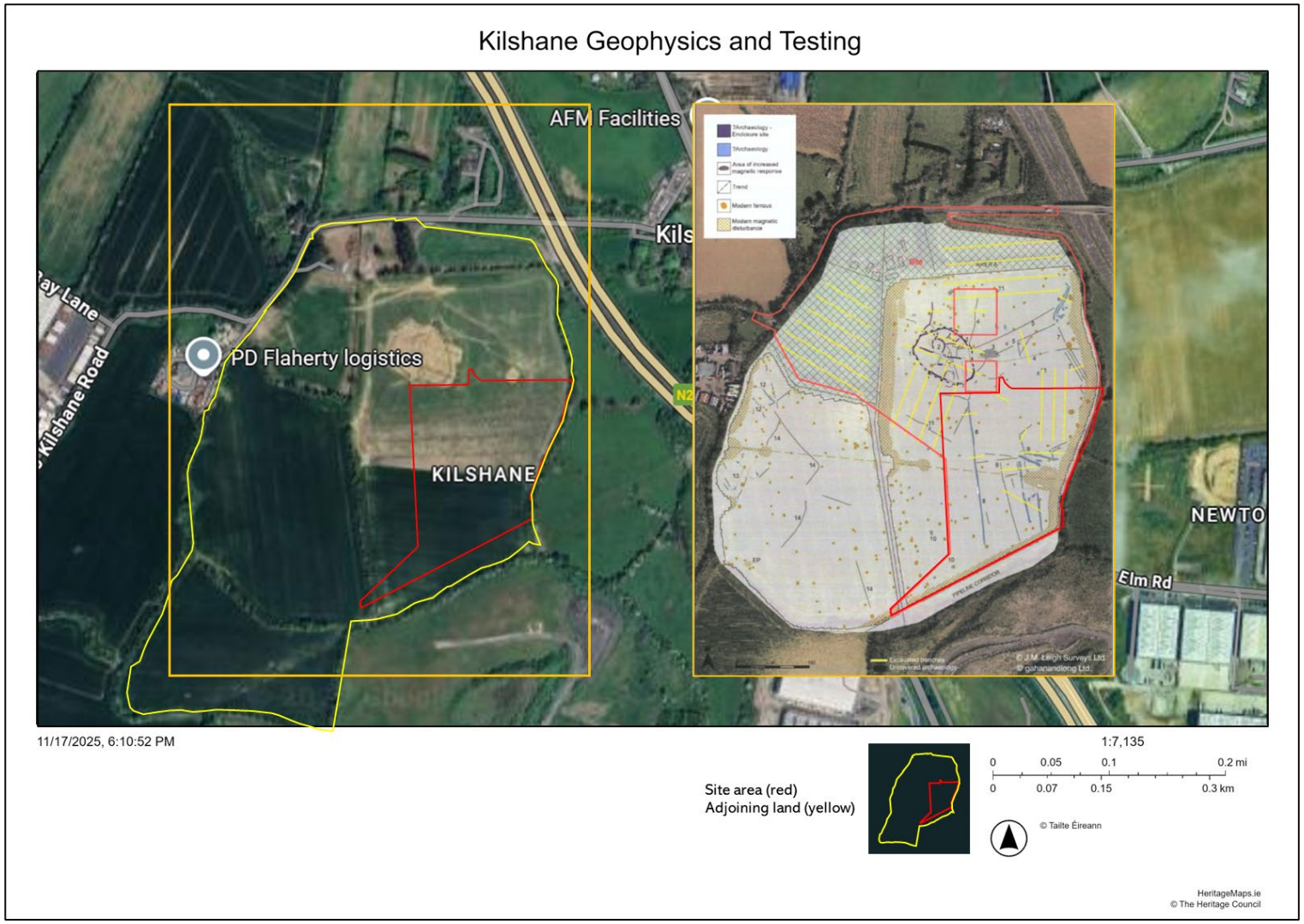
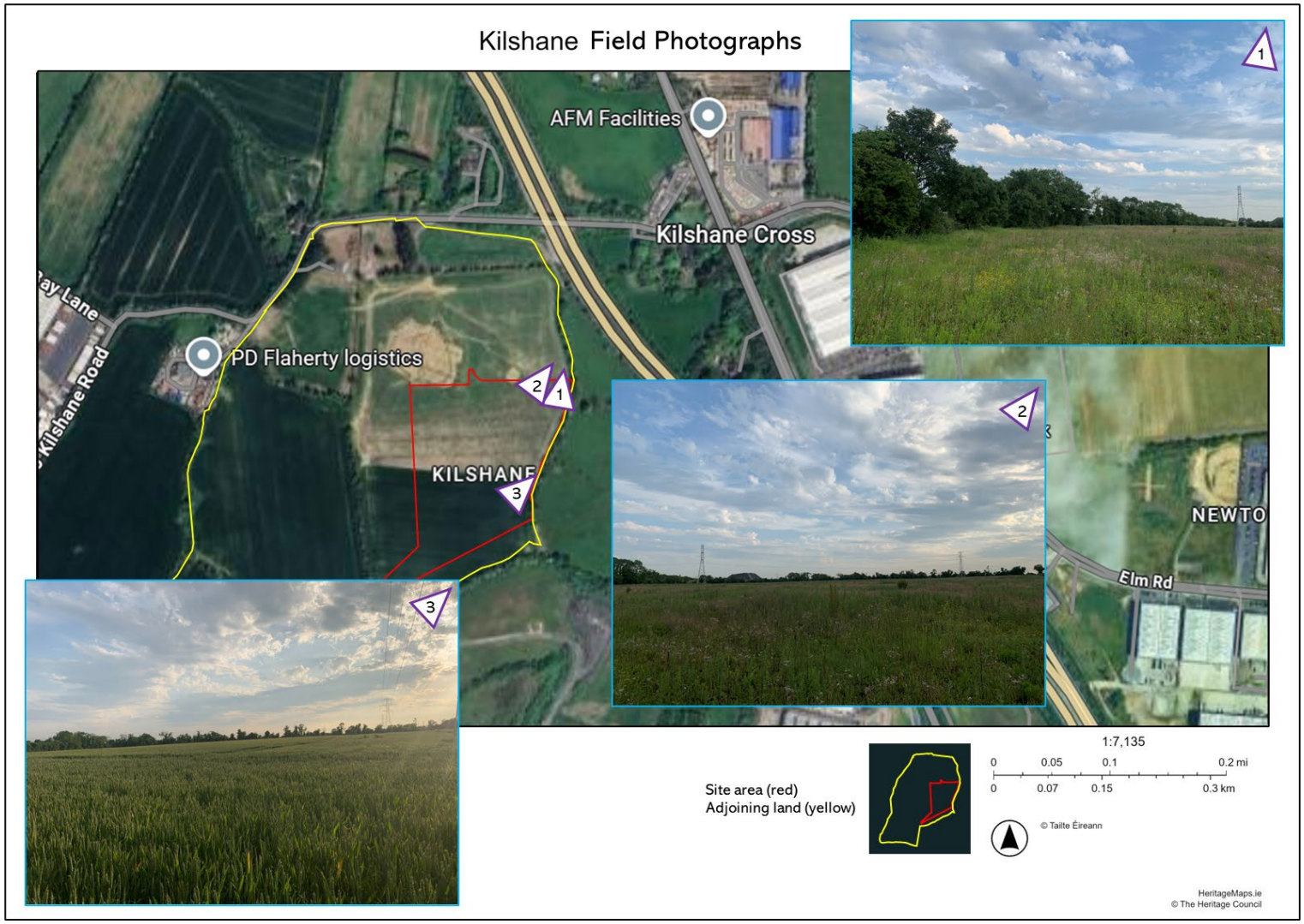


Figure 12-13. Extract from aerial photograph of the area showing results of field survey (Google Maps)[30]



[30] https://www.google.com/maps

12.3 Receiving Environment

12.3.1.1 Introduction

The following summary is presented by time period, from oldest to most recent, describing the study area as a whole. The study area comprises the townland in which the proposed development is sited, Kilshane, and the surrounding townlands, equating to a buffer of approximately 1.5km (see Figure 12-1).

Kilshane is in the Electoral Division of Finglas ED 1901, in the Civil Parish of Finglas, in the Barony of Castleknock, in the County of Dublin. The Irish name for Kilshane is Cill Sheáin[31].

Kilshane borders the following other townlands:

- Bay to the west
- Broghan to the north
- Cherryhound to the north
- Dunsoghly to the east
- Huntstown to the south
- Johnstown to the east
- Mitchelstown to the west
- Mooretown to the west
- Newtown (E. D. Finglas) to the east

12.3.1.2 Pre-History

The earliest evidence for settlement consists of the archaeological features excavated in advance of previous development works in the form of excavations undertaken at Kilshane (License no. 03E1359 ext.). The earliest activity on the site is marked by the creation and gradual infilling of a large mid-Neolithic ditched enclosure. This enclosure was broadly egg-shaped, narrowing to a pointed apex in the north, and measured about 45m by 34m externally, enclosing roughly 850m². Excavation revealed that the ditch's irregular outline resulted from its construction in a series of interconnected segments, each between 6m and 13m long, averaging 8.9m. These segments varied in shape, from broad U-profiles to sharper V-profiles and often joined at slight changes in level or direction. Sharp turns at the apex and the south-eastern and south-western edges likely reflect inaccuracies between different work groups digging at different times. Evidence such as antler tine fragments suggests the use of antler tools in excavation.

Once cut, the ditch began to slump and silt naturally. At this early stage, a separate segmented ditch with at least four causeways was constructed nearby to the north-west (Site 5c). Subsequently, a large quantity of cattle bone—representing 60–70 animals, the largest Neolithic assemblage from a single excavated context—was deposited around the ditch. Bones were placed both articulated and disarticulated, sometimes from inside the enclosure and sometimes from outside, with no obvious butchery marks. Fully articulated skeletons were particularly concentrated in the eastern area. Stones and boulders also accumulated, possibly through erosion.

As deposition continued, further silting and slumping occurred, followed by additional infilling. Finally, a large mid-Neolithic pottery vessel was deliberately placed in the south-east section, with other ceramic fragments elsewhere, after which the enclosure was abandoned for a long period.

Early Bronze Age activity was marked by deposits and features concentrated mainly along the eastern side of the earlier enclosure ditch. After the ditch had filled and been sealed by an orange clay layer, numerous shallow scoops and pits—mostly under 0.2 m deep—were cut into it. These intercutting features contained a largely uniform midden-like fill with ash, cinders, burnt and unburnt bone (including possible human remains), pig and ovicaprid bone, some shaped into pins or awls, and abundant lithic material. The flint

[31] https://www.logainm.ie/en/17323

assemblage included micro-debitage, pebble cores, thumbnail scrapers, a hollow-based arrowhead, a reworked barb-and-tang arrowhead, a flint piercer, and a large hollow scraper, alongside chert, quartz and coarse stone.

Ceramics formed the dominant artefacts, consisting of high-quality Early Bronze Age funerary and ceremonial vessels—food vessels, cordoned urns, cinerary urns, Irish bowl food vessels, and other forms. Multiple vessel types were often deposited together.

A compact metalled surface, likely sealing the midden, overlay this deposit, itself topped by a more disturbed horizon extending around the ditch. Additional pits with similar material occurred near the northern apex. Beyond and within the enclosure, features included unusual cremation pits with sloping burnt clay and crushed bone, probable cleaned-out cremation pits, and one disturbed crouched inhumation. Other internal pits contained small amounts of charcoal, bone and pottery. A single hearth represents later Bronze Age activity.

There is abundant further evidence of human settlement in the Bronze Age in the study area. Five ring-ditches area recorded from Coldwinters (DU014-015----) and Newtown (DU014-100----, DU014-134----, DU014-135---- and DU014-141----) and a further ring-ditch was found during archaeological excavations between Tyrrellstown and Cherryhound (License no. 07E1147). Ring-ditches are generally characterised by a low, artificial mound, sometimes with an encircling ditch and bank, and are considered to be Bronze Age burial sites.

Two burnt mounds and a possible fulacht fiadh have been identified in advance of development works in the study area, at Newtown (License nos. 03E1450 ext. and 04E0807) and along the Tyrrelstown to N2 (Cherryhound Interchange) link road (License no. 08R0017). 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[32]. 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.

12.3.1.3 Early Medieval

Ireland during the Early Medieval Period was a patchwork of larger and smaller kingdoms known as túath and trícha cét respectively. During this period, Ireland is depicted in the surviving historical sources as entirely rural. The area of the Proposed Development was part of territory of Brega and earliest historical records note that the Síl nÁedo Sláine, a dynasty of the southern Uí Néill, were the dominant rulers during the early medieval period[33]. They likely paid tribute and gave fealty to the King of Tara.

A substantial burial ground was discovered in Kilshane during topsoil removal and subsequent excavation prior to construction of a gas pipeline in 1988 (License nos. E440 and 99E0220; see also Excavation no. 1999:18 and SMR no. DU014-048----). Excavation at the site uncovered a total 123 burials, many of which were identified as children and adolescents. A 9th -13th century origin for the remains uncovered has been suggested given the majority of the remains uncovered were in an east-west (Christian) orientation.

Further geophysical survey undertaken in Kilshane in 2022 (License nos. 22R0059 and 22R0201) identified several curvilinear enclosures, linear ditches, a curving double ditch-type feature, areas of burning, pits and additional anomalies. Archaeological testing confirmed the findings of the geophysical surveys (License no. 22E0536). Three major enclosing ditches identified through geophysics were confirmed by testing.

Ringforts, the characteristic settlement site of the early medieval period, generally consist of a circular area surrounded by a bank or fosse, or simply by a rampart of stone. Ringforts are usually interpreted as

[32] Waddell, J. 2000. *The Prehistoric Archaeology of Ireland*. Galway, Galway University Press.
[33] Byrne, F. J. 1973. Irish kings and high-kings. London: Batsford, p. 88.

being defended farmsteads. Many ringforts have been partially or completely destroyed since the 1960s and often the only indication of the former presence of a ringfort is preserved in townland name elements such as Dún, Rath, Cashel or Lios. However, monuments which have experienced above-ground disturbance continue to be of archaeological interest due to the potential for subsurface remains to exist at their locations. The term 'enclosure' is applied to monuments that cannot be classified more accurately without archaeological assessment but were identified as enclosures during fieldwork or through the study of aerial photography or other sources[34]. Three ringforts are known from the study area in Newtown (SMR nos. DU014-006001-, DU014-006002- and DU014-097----). Excavations have also uncovered remnants of ringforts in Fingal (License nos. 17E0569, 17E0569 ext., 17E0570 and 18E0073). Finally, in addition to the above noted enclosures, there are three recorded enclosures in the study area at Newtown (SMR no. DU014-007----), Coldwinters (SMR no. DU014-016----) and Kilshane (SMR no. DU014-093----).

Christianity arrived in Ireland in the early part of the 5th century AD and is testified by the numerous early monastic site and churches. In addition to the east-west oriented Christian burials discussed above, the holy well at Kilshane (SMR no. DU014-012003-) is evidence of religious activity in the study area at this time.

12.3.1.4 Later Medieval

The Anglo-Norman's arrived in Ireland in 1169, to support the deposed king of Leinster, Diarmuid MacMurchadha. By the end of the 12th century the Anglo-Normans had succeeded in gaining control over much of the country. Leinster was 'sub-infuedated', meaning that great swathes of land were parcelled out among the Anglo-Norman elites. The Anglo- Norman tenurial system more or less appropriated the older established land units known as túaths in the early medieval period but described the territories as manors[35].

Mottes were among the first fortifications constructed by the Anglo-Normans on their arrival in Ireland. In their original form they consisted of steep-sided earthen mounds, topped with a wooden lookout tower or bretesche, the surviving remains generally consist of a flat-topped conical mound. The mottes are often associated with a rectangular enclosure, known as a bailey, which would have housed buildings. Mottes were usually located at easily defensible strategic sites. Moated sites, in comparison, represent the remains of defended farmsteads dating from a secondary phase of colonisation/settlement, during the 13th and 14th centuries. They are usually square or rectangular areas, defined by banks and external ditches[36]. There are three recorded mottes in the study area, at Kilshane (SMR no. DU014-001----), Dunsoghly (SMR no. DU014-005003-) and Newtown (SMR no. DU014-013), the latter two of which have associated baileys.

Tower houses were constructed in the later medieval period including at Dunsoghly (SMR no. DU014-005001-). Tower houses are small, fortified residences which were constructed following a period of unrest in the 14th century. Tower houses have various defensive features including thick walls, battlements and narrow windows. As time progressed and the requirement for defence lessened tower houses were replaced by hall houses and fortified residential houses. Residential extensions were also added to existing tower houses to provide more comfortable accommodation for the occupiers[37].

12.3.1.5 Post Medieval

The 17th century witnessed the systematic reduction of all of Ireland to English authority, largely through conflicts and the forced settlements, 'The Plantations'. As part of the process of achieving colonial dominion a number of surveys and mapping programmes were completed throughout the post-medieval period. The Down Survey[38] (undertaken in 1656–58) was overseen by the surgeon-general of the English army,

[34] Stout, M. 1997. *The Irish Ringfort*. Dublin: Four Courts Press, p. 22-31.
[35] MacCotter, P. 2008. Medieval Ireland: territorial, political and economic divisions, Dublin: Four Courts Press, 2008.
[36] Harbison, P. 1992 *Guide to the National and Historic Monuments of Ireland*. Dublin. Gill and Macmillan.
[37] Harbison, P. 1992 *Guide to the National and Historic Monuments of Ireland*. Dublin. Gill and Macmillan.
[38] https://www.downsurvey.tchpc.tcd.ie/

William Petty and a number of former soldiers. This survey It was not just a project of mapping but of social engineering that was underpinned by a massive transfer in landownership from Irish Catholics to English Protestants. This survey is the first ever detailed land survey on a national scale anywhere in the world and gives great insight in Ireland at this time. The maps for the area (see Figure 12-4) demonstrate that this area was very much 'within the Pale' as it is under Protestant control, with numerous tower houses (including that at Newtown), manor homes and monasteries noted. Although formally listed as being in the Barony of Castleknock in the Parish of Finglas, Kilshane is very much at the junction of the three baronies of Castleknock, Coolock and Nethercross, which the Down Survey describes as follows:

Castleknock *- The Barony of Castlenocke in the County of Dublin Is bounded on the East with the barronyes of Coolocke and Nethercrosse, on the West with the Barronyes of Ratooth and Donboyne in the County of Meath and on the South with the Barrony of Newcastle and it is meared on that side with a ffaire river called the Liffy. The quallity of the soyle thereof is generally good arrable meadowe and pasture. It containes the ensueing parrishes vizt: Mallahidert, Warde, Killoghan and Castleknocke parrishes. What improvements there are upon the forfeited lands is perticularly described in the severall parrishes hereoute annexed.*

Coolock *- The Barony of Coolock in the County of Dublin Is bounded on the North and East with the Irish Sea, or ST George his Channell on the South East and South with the Bay and Libertyes of the City of Dublin on the West with the BAronyes of Castleknock and Crosoe on the North West and North with the Baronyes of Balroddery and Crosoe all in the said County. The Soyle thereof is Indifferent good but the west is much better than the east it is for the most part Arrable and Furrz & Pasture there is but little Meadow therein: The inhabitants of this Barony have no other ffyreing but only ffurzz. It Conteynes the Parishes of Hillostree Killeagh St Margretts Santry Cloghran part of Swordes Mallahide Portmarnock Coolock part of ffinglas Ratheny and Howth, The Chiefe towne in this Barony for Antiquity is Coolock from whence the Barony takes its name but at present it is much inferior to many others the Chiefest place Built are Mallahide and Donsoghly through this Barony Lyes the High Roade from Dublin to Swordes and so the province of Vlster. The Broadest part of this Barony is from the point of Howth in the East, to the Newtowne of Dunsoghly in the West being Eight Miles and three Quarters of a Mile and the Longest part from South to North is from is Greene of Dublin in the South to Killostery in the North: Seven Miles a halfe the Whole Circumference of it is forty and Eight Irish Miles and Quarter of a Mile and Three Score perches.*

Nethercross *- The Baronie of Nethercross in the Countie of Dublin The Quallitie of the Soyle is verry good and profitable Consisting of Arable pasture and Meadow; there is some little wood land and Bogg the former being very Advantageous for ffuell Building Shelther of Cattle repaire fenceing and the like and the latter in respect of the Smallnes of its Quantity Not Considerable. It is finely watered by many small Riveletts one whereof running along by the side of Homedon parrish cuts through the parrish of Swords and soe dischargeth it selfe into the Sea. It Lyes not farr, re mote from the Citty of Dublin, In respect whereof the Inhabitants are greatly advantaged both for furnishing themselves with provisions and necessaryes as also for putting of such comodities as providence: their industry and the fruitefulnes of the Soyle yeelds them Besides it would be noe Inconsiderable benefit would arise to this Barony by reason the Sea lyes so were it were the Inhabitants as Ingenious and Laborious in making up fensing and so reserveing Certaine haveng avid crookes there for fishing riding safe of large Vesells and coming on of Lesser as Nature has been bountifull in affording them so great a meanes of nigh reaching themselves Churches and other Improvements upon it and situate neere it serveing as well for use couert and profitt as for delight pleasure and prospect. Within are contained the parrishes of Swords Luske ffinglas portrane and Clomedon being flew in all most of them lying in Severall partes the Barony of Balagthery lying intermixed and lyeth amongst them. What else is material in the parrish Refference as in their proper places.*

The study area is depicted as farmland interspersed with small development clusters interconnected by a road network on the first and second edition Ordnance Survey Maps (see Figure 12-6, Figure 12-7 and Figure 12-8). The Proposed construction compound is located on the location of Nangor Caste (SMR no.

DU017-037----), as clearly shown on the early editions of the Ordnance Survey maps (Figure 12-6, Figure 12-7 and Figure 12-8).

John Rocque's mid-18th century map[39] of the southwest of Dublin depicts the study area as being in agricultural land, mainly under crop, with the towns of Newtown and Huntstown clearly depicted, with roadway between them (see Figure 12-5).

The first edition Ordnance Survey map, dating to the 1830s, depicts the site of the Proposed Development in agricultural land, 95% of the redline boundary being within one large field. Substantial hedgerows are shown, to the east of the redline boundary is the grounds of Kilshane House and demesne. Most notable though are the *Church Field*, *Church Well* and *Old Burying Ground* depicted immediately to the southeast of the redline boundary (see Figure 12-6; see also Figure 12-1; SMR nos. DU014-012001 (Church), DU014-012002- (Burial ground) and DU014-012003- (Ritual site - holy well)).

Little changes in the intervening time to the drafting of the 25 inch (Figure 12-7) and last edition 6 inch (Figure 12-8) Ordnance Survey maps dating to the early 20th century. Of note is the absence of the depiction of Church Field and Old Burying Ground, the Church Well is now depicted as 'site of'. Kilshane house also moves to the northeast to Kilshane Bridge.

Remarkable little also changes between the early 20th century and modern times, and evidenced by the 1995 (Figure 12-9), 2013-2018 (Figure 12-10), and most recent Google Maps (Figure 12-11) aerial photography, with the land remaining in agricultural use despite the influx of development in the surrounding areas. The recent archaeological investigations in the area (see below) are clearly visible in the Google Maps imagery.

12.3.1.6 Recent Archaeological Investigations[40]

The site of the Proposed Development was assessed as part of a wider assessment in 2022, comprising archaeological geophysics, testing and excavation (see Figure 12-12).

Geophysical survey (Licence no. 22R0092) identified a number of anomalies which were determined to possibly represent archaeological features. Of particular note, there was a potential large, oval shaped enclosure with possible internal structures/divisions. This potential enclosure measured approximately 90m northwest-southeast by 65m northeast-southwest. It appeared to contain a number of internal divisions/structures most notable of which was a possible sub- circular structure approximately 18m in diameter. Additional features included a section of a possible double ditch located in the northeast area of the site and part of a potential rectangular enclosure located in the southeast section of the site. It was concluded that this possibly related to the church site (SMR no. DU014-012001).

Test excavations (Licence no. 22E0348) confirmed the presence of an enclosure in the middle of the subject area of probable Early Medieval date (to the immediate north of the Proposed Development redline boundary – see Figure 12-12). The remains of associated internal features were also recorded during test excavation. External gullies and pits suggested to be contemporary with the enclosures were recorded to the west and east of the enclosure. Plough furrows and modern drainage gullies were also noted across the site.

Topsoil stripping of the full area of the enclosures and associated features was undertaken and full excavation and recording of all archaeological features was conducted. Three phases were identified within the testing excavation. Enclosure 1 was the large sub- oval enclosure identified by geophysics and test trenching. It consisted of a single ditch which was not uniform in size or depth which may have functioned as a substantial drain rather than a defensive feature. It had an entrance to the south and its southeastern

[39] Https://www.dublinhistoricmaps.ie/maps/1600-1799/index.html
[40] Lynn, C. 2022. *Preliminary Archaeological Excavation Report, Kilshane, Co. Dublin (Licence no. 22E0348).* Unpublished report on archaeological excavations by Gahan and Long Archaeological Consultants.

terminus had been recut. Eleven structures of similar construction contained within the enclosure probably belonged to this phase of activity on site This enclosure cut through the earlier enclosure 2, located at the northwestern end of the excavation area. Stone packing was present along its entire base, suggesting it may have originally functioned as bedding for a stone wall and thus the enclosure may have been a Cashel. Two structures were contained within this enclosure. Both enclosures cut through pre-existing, probably prehistoric, structures present at the northwestern area of the site. Although there were eight structures in total, the focus of activity seems to have been around the substantial structure 3, with the other structures clustered to its north and northeast. A single structure (structure 10) was present to the south, 15m away from the other probable prehistoric activity, but it had been badly truncated by enclosure 1 and modern drains and may not be related to this phase of activity.

12.3.1.7 Field survey

The Proposed Development lands remain in agricultural use to the present day, comprising a large field with gently undulating topography with mature hedgerow boundaries, in open pasture (see Figure 12-13).

12.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of this EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

12.4.1 Construction Phase

The Proposed Development will involve ground disturbance during construction phase in the form of topsoil stripping and the excavation of foundations for buildings and laying of services, as well as topsoil stripping for temporary infrastructure.

12.4.2 Operational Phase

There will be no ground disturbance during the operational phase of the Proposed Development.

12.1 Potential Impacts of the Proposed Development

12.1.1 Construction Phase

There are no recorded archaeological listed in the Sites and Monuments Record and / or the Record of Monuments and Places within the redline boundary for the Proposed Development.

There are a 25 recorded archaeological sites within the study area, none of which will be impacted directly or indirectly by the construction phase.

There have been a large number of archaeological excavations undertaken within the study area (including within the Proposed Development), many of which recorded archaeological remains from prehistoric to medieval and post-medieval in date.

The site of the Proposed Development has been subjected to geophysical survey and archaeological testing. Whilst these assessments identified archaeological remains to the immediate north of the Proposed Development, no archaeological feature were identified within the Proposed Development lands.

Potential impacts on archaeological and cultural heritage associated with the Proposed Development involves ground disturbance associated with the construction phase. Should archaeological remains survive below surface, then ground disturbance in these areas would remove sub-surface features.

There are three sites within the study area listed in the Record of Protected Structures for Fingal County, all of which are also listed in the Sites and Monuments Record. None of these will be impacted, directly or indirectly, by the Proposed Development.

In the absence of mitigation measures the potential impact of the construction phase of the Proposed Development on archaeological, cultural or architectural heritage during the construction phase is *permanent*, *negative* and *not significant*.

12.1.2 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.

12.2 Mitigation Measures

12.2.1 Construction Phase

A mitigation strategy for the Proposed Development has been stipulated by Fingal County Council in relation to a previous planning application (Planning reference no FW22A/0204; see Appendix 12.4).

- A suitably qualified archaeological consultant should be appointed to oversee the project from design through to planning and construction phase.
- Archaeological monitoring of the removal of topsoil across the Proposed Development should be undertaken by a suitably qualified archaeologist under licence to the National Monuments Service of the Department of Housing, Local Government and Heritage.
- Should archaeological or architectural heritage features, deposits or structures be uncovered during survey should be cleaned by hand, investigated and recorded.
- Archaeological excavation of features, deposits or structured identified, should be undertaken in advance of construction, in consultation with and under license to the National Monuments Service of the Department of Housing, Local Government and Heritage.

Applying these mitigation measures will ensure that the effect on the archaeology and architectural heritage will be *permanent*, *neutral* and *imperceptible*.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of Housing, Local Government and Heritage.

12.2.2 Operational Phase

As there are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development, no mitigation is required.

12.3 Monitoring or Reinstatement Measures

12.3.1 Construction Phase

Other than the above noted requirement for archaeological monitoring of groundworks associated with the construction phase of the Proposed Development, there are no additional requirements relating to archaeological, cultural or architectural heritage for ongoing monitoring or reinstatement at construction phase of the Proposed Development.

12.3.2 Operational Phase

There are no additional requirements relating to archaeological, cultural or architectural heritage for ongoing monitoring or reinstatement at operational phase of the Proposed Development.

12.4 Residual Effects of the Proposed Development

12.4.1 Construction Phase

There are no residual effects of the Proposed Development on archaeological, cultural or architectural heritage at construction phase of the Proposed Development.

12.4.2 Operational Phase

There are no residual effects of the Proposed Development on archaeological, cultural or architectural heritage at operational phase of the Proposed Development.

12.5 Cumulative Impacts of the Proposed Development

12.5.1 Construction Phase

There have been numerous licensed archaeological investigations within the study area, dating from 1998 to 2022, relating to development works. Archaeological features were identified in several of these. Future developments, including the additional turbines proposed as part of the Phase 2 development (Proposed Development) and the future separate / additional 400kV grid connection (subject to a separate application), may result in the uncovering of previously unrecorded archaeological features and therefore impact on them. Should any sub-surface features exist that will be potentially impacted on by the Proposed Development and / or any future proposed developments, they will be archaeologically recorded in advance of construction works in these areas, in consultation with and under license to the National Monuments Service of the Department of Housing, Local Government and Heritage.

The academic knowledge gained from the excavation of these features, has resulted in a net cumulative *permanent*, *significant*, *positive* impact.

12.5.2 Operational Phase

During operation there is no potential for cumulative impact as there will be no disturbance to ground.

Chapter 13 – Traffic and Transportation

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4. TRAFFIC AND TRANSPORTATION

4.1 Introduction

This chapter assesses the potential effects of the Proposed Kilshane Phase 2 Development, on the surrounding area regarding vehicular, pedestrian and cycle access throughout the lifetime of the development. Furthermore, the potential impact of vehicular movement during the construction and operational phases of the Proposed Development is considered.

The chapter outlines the methodology employed, the receiving environment at the application site and its surroundings, the characteristics of the proposal in terms of physical infrastructure, the potential effect that proposals of this kind would produce, the predicted likely impact of the proposal on the local road network, and the mitigation measures required to prevent, reduce or offset any significant adverse effects.

This chapter was completed by Fernando De Maio and Stephen Dent-Neville of Waterman Moylan Consulting Engineers. Fernando is a Civil Engineer with over 11 years' experience and Stephen is a Chartered Engineer with over 13 years' experience. Further information on the professional qualifications and affiliations of the authors of this chapter can be found in the introduction chapter of this EIAR.

4.2 Methodology

The study area for this chapter is the transport network and junctions immediately surrounding the site which will be affected as part of the Proposed Development. The junctions chosen for assessment are outlined in Section 4.3.1.3.2 below and were chosen based on professional judgement and observed vehicle behaviour within the local road network.

In line with best practice, the following methodology has been adopted for this assessment:

- A review of relevant available information was undertaken. This includes the Fingal Development Plan 2023–2029, existing traffic information, traffic and transport assessments submitted with planning applications for committed and potential future developments, as well as other pertinent studies.
- Consultations with Fingal County Council through the pre-application meetings, to agree on the site access arrangements and to determine the scope of the traffic analysis required to accompany the planning application.
- The Traffic section of this chapter is prepared with the following detail:
  - Obtain data on existing traffic flow conditions.
  - Determine trips to be generated by the Proposed Development and the committed and potential future developments in the surrounding area.
  - Determinate trip distribution for each development.
  - Assess the percentage impact of traffic generated by the site in relation to existing traffic flows at local junctions. Determine if this exceeds 5% at congested junctions or 10% at non-congested junctions.
  - Modelling the junctions with a high impact, based on the threshold indicated above.
  - Identify, if necessary, mitigation measures.

4.2.1 Forecasting Methods and Difficulties Encountered

There were no difficulties in compiling information.

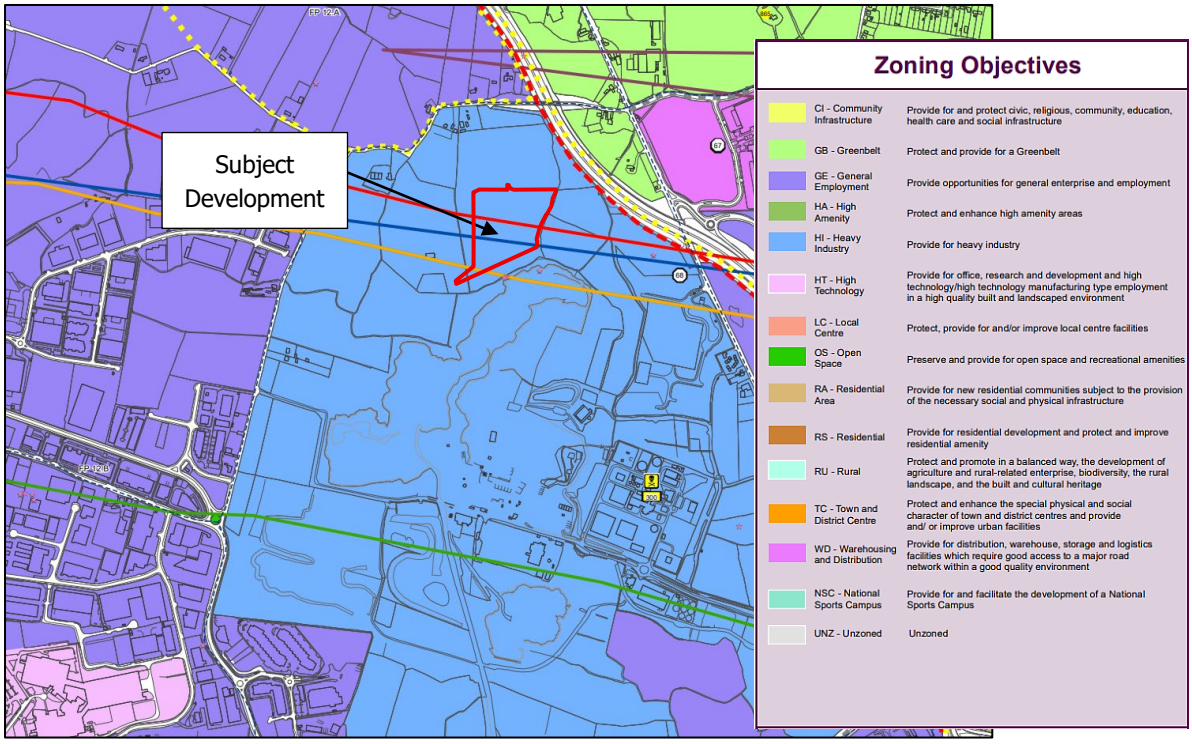
4.3 Receiving Environment

4.3.1.1 Land use

Land uses are defined in the *Fingal Development Plan 2023-2029*, which indicates that the subject site is located within an area designated as "HI – Heavy Industry". The objective is to provide for heavy industry.

Figure 4-1 below is taken from Sheet No. 12 of *Fingal Development Plan 2023-2029.*

Figure 4-1 Site Location and Zoning (Source: Sheet No. 12 of Fingal Development Plan 2023-2029)



4.3.1.2 Site Location and Description

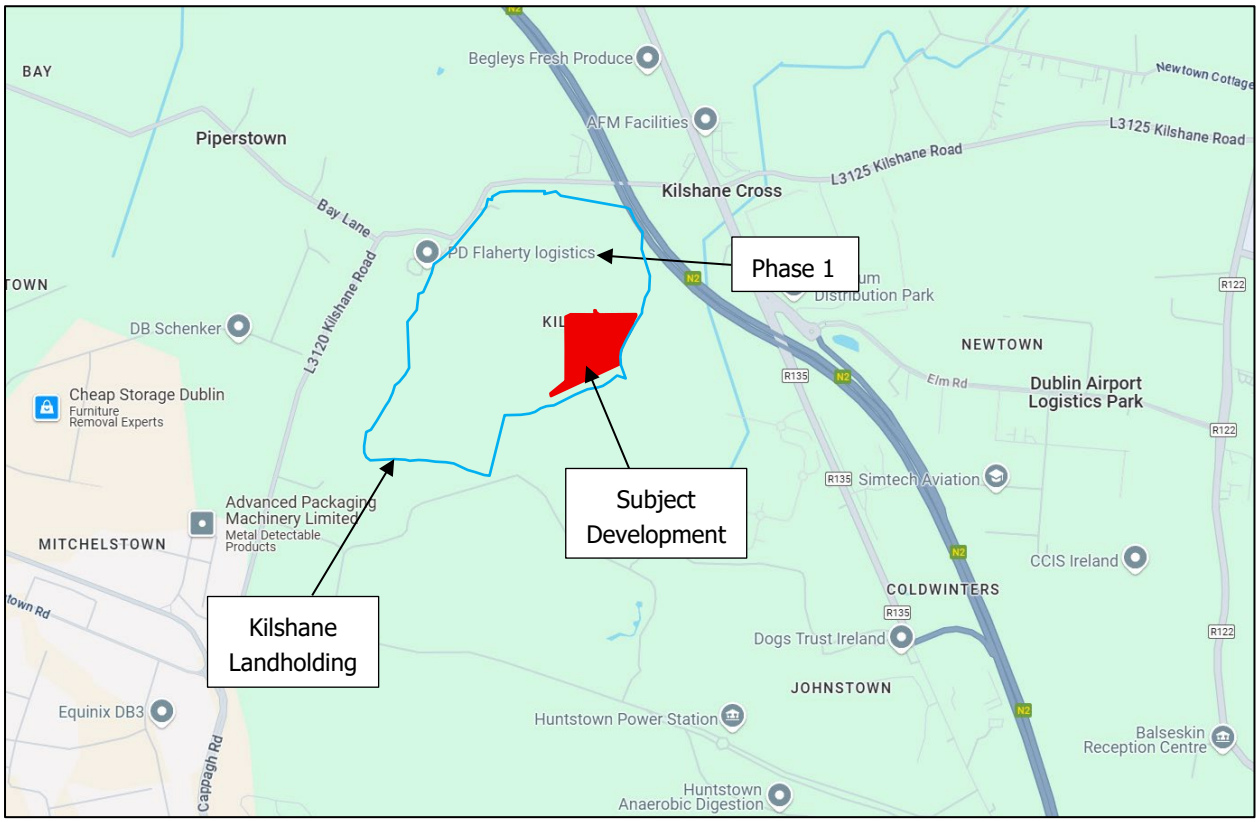
The site is located at Kilshane, Dublin 11, just west of the N2 Primary Road, approximately 300m west of the R135 and is located approx. 2 km north-west of the M50.

The site is bound to the north by the Phase 1 development which has received a notification to grant permission under Reg. Ref. ABP-317480-23. The remaining lands surrounding the site largely comprise agricultural fields, with the businesses and commercial/industrial sheds appearing in the wider vicinity east and west of the site.

The subject development forms part of a larger landholding pertaining to Kilshane Energy. The overall landholding is bound to the west of the site is a small-scale haulage premises (PD Flaherty Logistics). Beyond the M2 to the east are areas of commercial / logistics development including Quantum Distribution Park and Dublin Airport Logistics Park, beyond which lies further greenfield lands and Dublin Airport. Huntstown Quarry, Huntstown Power Station and anaerobic digestion facility are located further to the south of the site.

Figure 4-2 below shows the location of the subject development.

Figure 4-2 Site Location

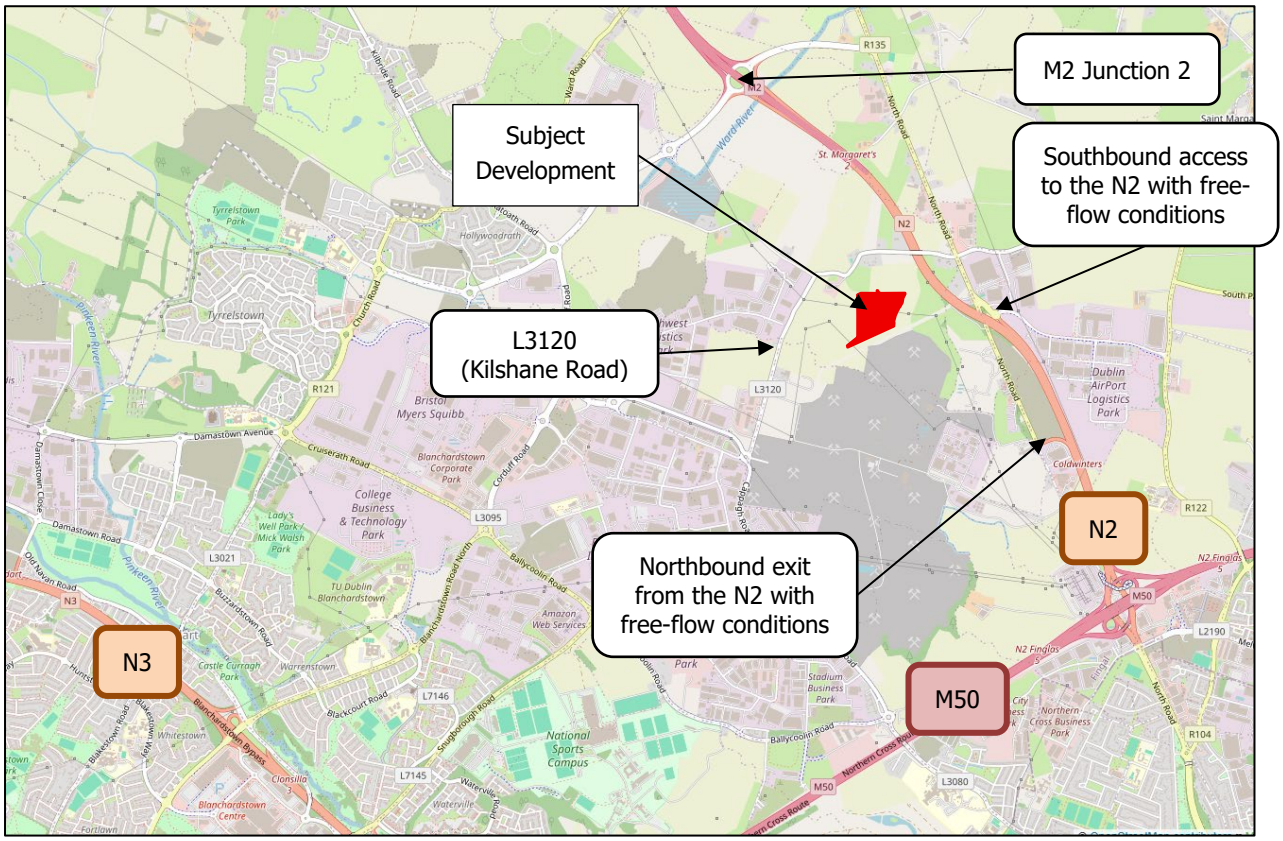


4.3.1.3 Existing Road Network

4.3.1.3.1 Roads

The key roads within this network are shown in Figure 4-3 and described below.

Figure 4-3 Existing Road Network



The subject site is currently accessed from the **Kilshane Road (L3120).** The Kilshane Road at this location is a 2-lane carriageway with a posted speed limit of 60 km/hr. There are no dedicated pedestrian and cycle facilities at this location.

The **R135** at Kilshane is a regional single carriageway road with a pavement width of approximately 9 metres. It follows a north-south alignment, extending northward towards Ashbourne and connecting southward to the N2. The N2 in turn provides access to the M2 motorway via junctions 2 and 3. The road is subject to a speed limit of 60 km/h. There are no dedicated pedestrian or cycling facilities along this section of the R135.

The **N2** at Kilshane is a national primary road that forms part of the strategic route connecting Dublin to the northwest of Ireland. It features a dual carriageway configuration in this area and links directly to the M2 motorway at junctions 2 and 3. There are no dedicated pedestrian or cycling facilities along this section of the R135.

The **N3** road is a national primary road running between Dublin, Cavan and the border with County Fermanagh. The former section from its junction with the M50 to Dublin city centre, as well as the bypassed section from Clonee to the border with County Cavan, have been reclassified as the R147 road.

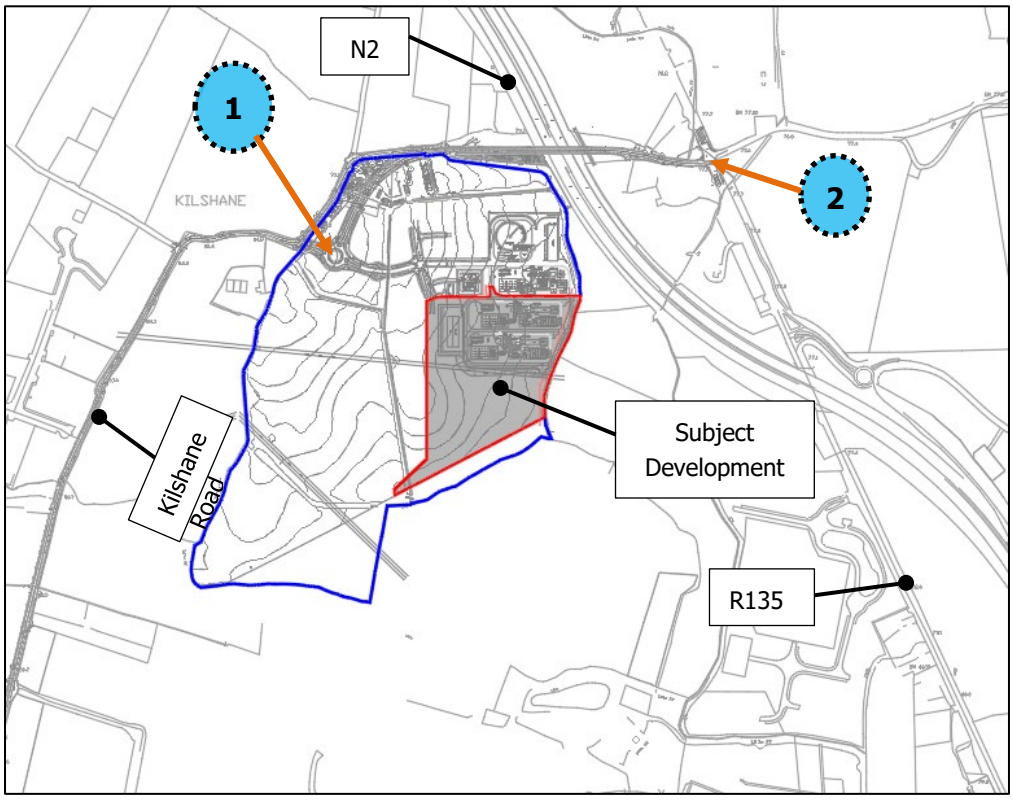
The **M50** at Kilshane is a major orbital motorway serving the Dublin region, providing a critical link between national primary routes including the N2 and M1. The M50 is a tolled motorway, and there are no dedicated pedestrian or cycling facilities along this section.

4.3.1.3.2 Junctions

The primary junctions in the vicinity of the subject development site that are considered relevant to the subject assessment are the following:

- Junction **1 (permitted roundabout)**: (L3120) Kilshane Road / Proposed Site Access to Phase 1 and Phase 2 development
- Junction **2 (Kilshane Cross) (signalised crossroads)**: (L3120) Kilshane Road / R135 / (L3125) Kilshane Road

Figure 4-4 Primary Local Junctions



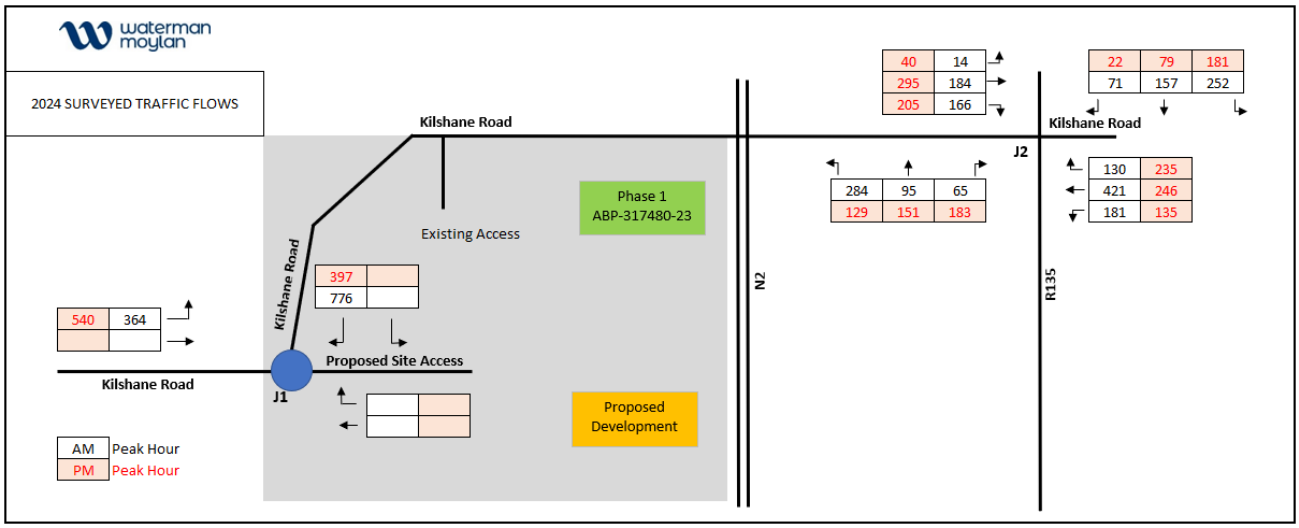
4.3.1.4 Existing Traffic Conditions

The existing traffic conditions for the subject site have been derived from the Planning Application Reg. Ref. No. FW24A/0339E. The Proposed Development includes a traffic survey carried out by IDASO on Thursday 2nd May 2024 over the course of 12 hours (7:00am to 7:00pm). Survey Results are included in the Appendix B of the Engineering Assessment Report included in the mentioned planning application.

Although the traffic survey was conducted at Junction 2 (refer to Figure 4-4 above), it is possible to extend the traffic impact assessment to Junction 1, as there are no developments along Kilshane Road (L3120) that would significantly alter traffic flow.

The results indicated that peak traffic volumes at the surveyed junction occurred during the morning period of 08:00–09:00 and the evening period of 17:00–18:00. These peak hour volumes are illustrated in Figure 4-5 below.

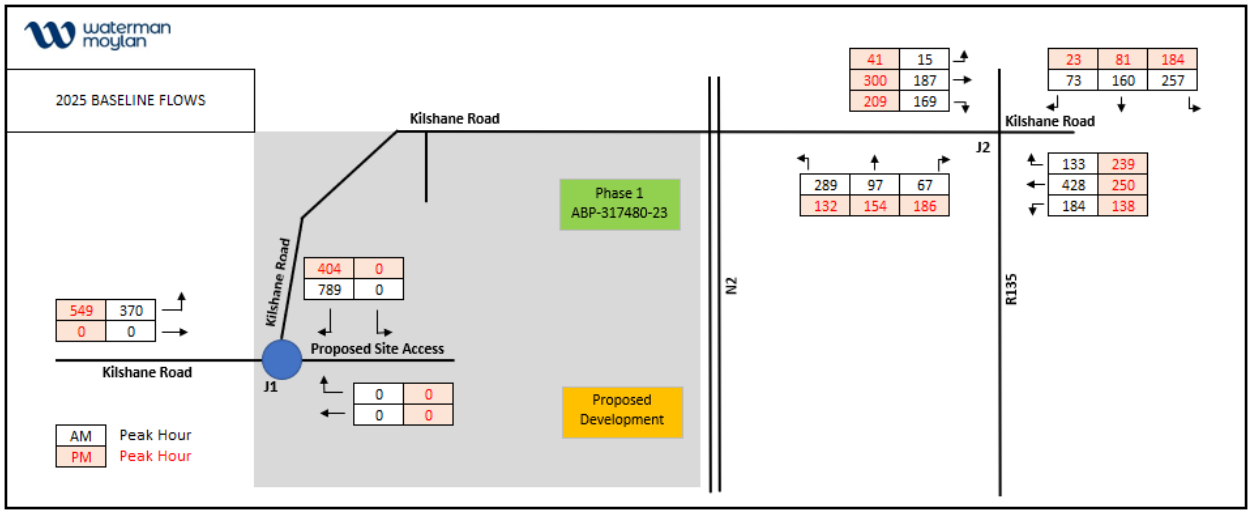
Figure 4-5 2024 Surveyed Traffic Flows



For the purposes of this current application, the traffic counts shown in Figure 4-5 above has been factored up to the year 2025 to establish the base traffic conditions. The background traffic growth rates used to factor up the flows are in accordance with the 'Table 6.1: Link-Based Growth Rates: Metropolitan Area Annual Growth Rates' within the TII Publications – Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021). These are:

- 2024 – 2025 (Central Growth Rate): 1.016

Figure 4-6 2025 Baseline Flows



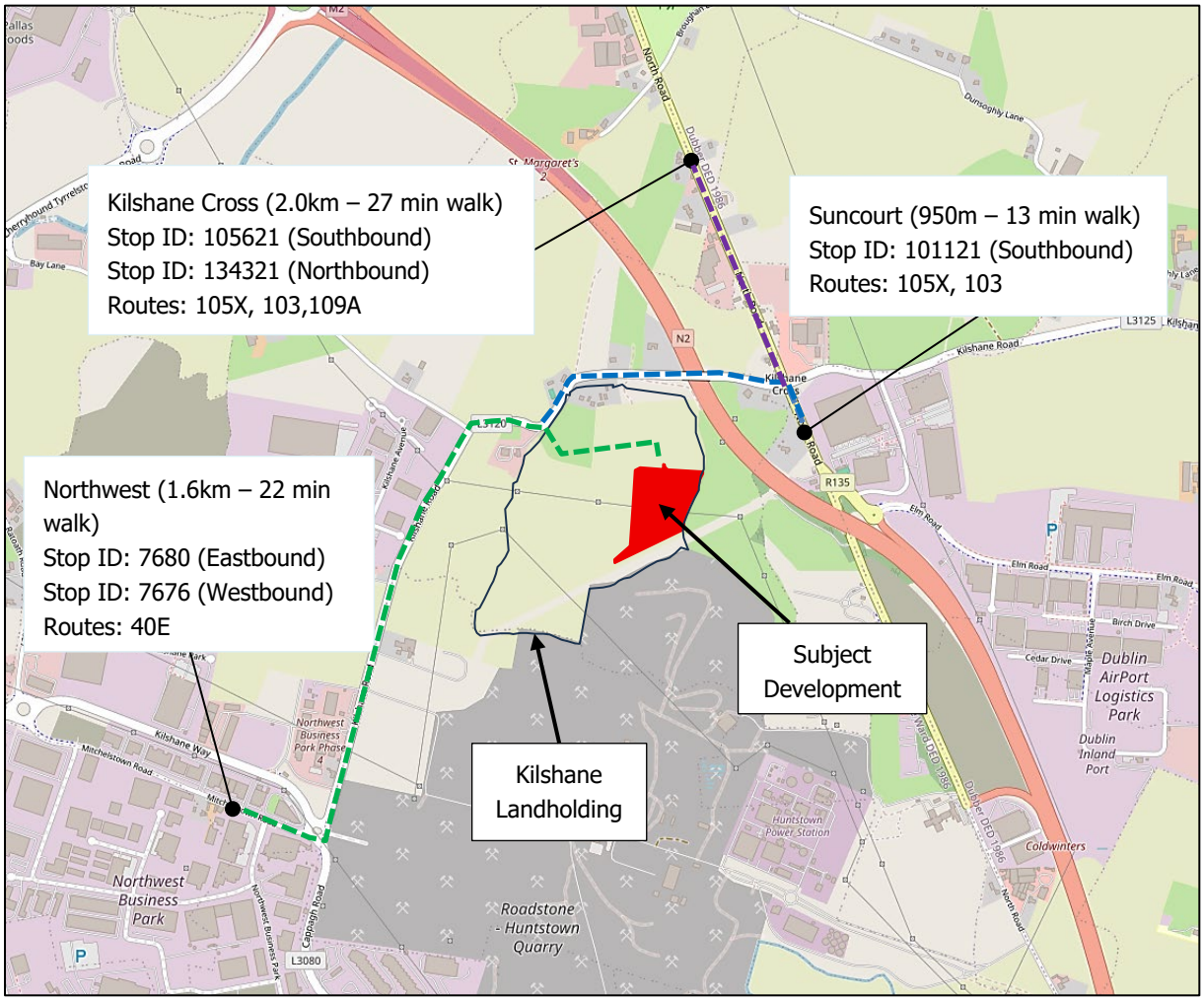
4.3.1.5 Multi-modal access to the site

4.3.1.5.1 Bus Network

There are no public transport services operating directly on Kilshane Road. The nearest bus stops are located on the R135. Additionally, there are bus stops located on the Mitchelstown Road at the Northwest Business Park, situated to the east and southwest of the site. Details on current bus services and walking routes to/from the site are provided below:

- "Suncourt" bus stop (Stop 101121) on the R135. This is 950m (approx. 13 min walk) away from the existing site entrance. This stop is served by bus routes 103 & 105X in a southbound direction only.
- "Kilshane Cross" bus stops numbers 105621 and 134321 on the R135. This is 2.0km (approx. 27 min walk) away from the existing site entrance. This stop is served by bus routes 103 & 105X in a northbound direction only.
- Northwest bus stops numbers 7680 and 7676 on the Mitchelstown Road at Northwest Business Park, serve route 40E in both directions and are 1.6km (approx. 22 min walk) away from the existing site entrance.

Figure 4-7 Bus Network – Walking distance from development to Bus Stops



The bus routes and their frequencies are provided in Table 4-1 below. The times indicated in the table are based on the timetable for each bus stop.

Table 4-1 Local Bus Routes and Frequencies

Route	Direction	Weekday Frequency	Saturday Frequency	Sunday Frequency
103	Beresford Place - Ratoath via Ashbourne	Every 20 minutes from 9:01 to 23:52	Every 30 minutes between 06:23 and 12:17 Every 20 minutes between 12:17 and 18:20 Every 30 minutes between 18:20 and 23:53	Every hour between 07;25 and 12:25 Every 30 minutes from 12:25 to 18:59 Every hour from 18:59 to 23:53
	Ratoath – Townsend via Ashbourne	20 minutes from 06:39 to 21:29 Every 30 minutes from 21:29 to 00:59	Every 30 minutes from 07:39 to 13:19 Every 20 minutes from 13:19 to 19:59 Every 30 minutes from 19:59 to 00:53	Every hour
105X	Dublin – Fairyhouse Road via Ratoath	At 17:54, 18:11 and 18:39	No service	No service
	Fairyhouse Road – Dublin via Ratoath	At 07:39, 07:54 and 08:09	No service	No service
109A	Dublin Airport – Kells via Navan	Every hour	Every hour	Every hour
	Kells to Dublin Airport via Navan	Every hour	Every hour	Every hour
40E	Broombridge Luas - Tyrrelstown	Every 30 minutes from 06:22 to 23:30	Every 30 minutes from 07:30 to 23:30	Every 30 minutes from 07:50 to 23:30
	Tyrrelstown - Broombridge Luas	Every 30 minutes from 05:37 to 22:45	Every 30 minutes from 06:40 to 22:55	Every 40 minutes from 07:15 to 23:30

4.3.1.5.2 Pedestrian Infrastructure and Walking Accessibility

There are no dedicated pedestrian walkways along Kilshane Road in the vicinity of the subject development. However, there is a pedestrian footpath, on the northern side of the road closer to the N2 east over the N2 flyover for approximately 380m.

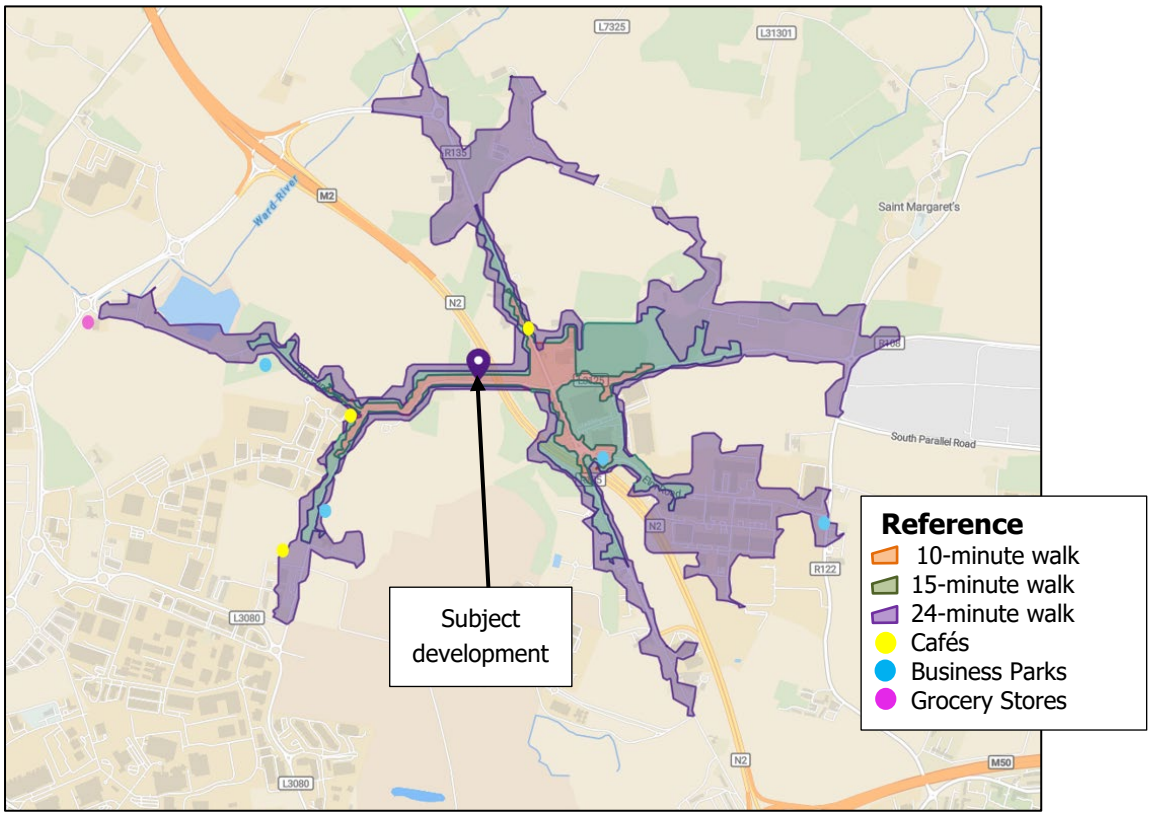
As a reference for the potential accessibility to the site, the "Guidelines for Providing for Journeys on Foot" published by the Institution of Highways & Transportation in 2000 was considered. This guideline indicates that acceptable walking distances will vary between individuals and circumstances, such as an individual's fitness, physical ability, and personal motivation; the size of the city itself and the quality of the surrounding footpath network. This document also suggests walking distances and times based on an average walking speed of 1.4m/sec (approximately 400m in five minutes). Table 4-2 below summarises these suggestions.

Table 4-2 Suggested Walking Distances (Source: Guidelines for Providing for Journeys on Foot)

	Town Centre	Commuting / School / Sight-seeing	Elsewhere
Desirable	200m (2.5 minutes)	500m (6 minutes)	400m (5 minutes)
Acceptable	400m (5 minutes)	1,000m (12 minutes)	800m (10 minutes)
Preferred Maximum	800m (10 minutes)	2,000m (24 minutes)	1,200m (15 minutes)

Figure 4-8 below details the 10-, 15- and 24-minute catchments areas, through the form of isochrones, to summarise the accessibility of the subject site on foot (Preferred Maximum) to Town Centres, Elsewhere and Commuting Schooling / Sight-seeing, respectively as per the table above.

Figure 4-8 Isochrone map indicating Walking Accessibility (Source: Smappen)



As illustrated, a 24-minute walk will enable access to bus stops and bus routes as was detailed in Section 4.3.1.5.1 above. It also provides access to amenities such as cafés, grocery stores and business parks.

4.3.1.5.3 Cycle Infrastructure and Cycling Accessibility

There is no dedicated cycle infrastructure along Kilshane Road as illustrated in Figure 4-9 below.

Figure 4-9 Existing cycling infrastructure (Source: Open Street Map)

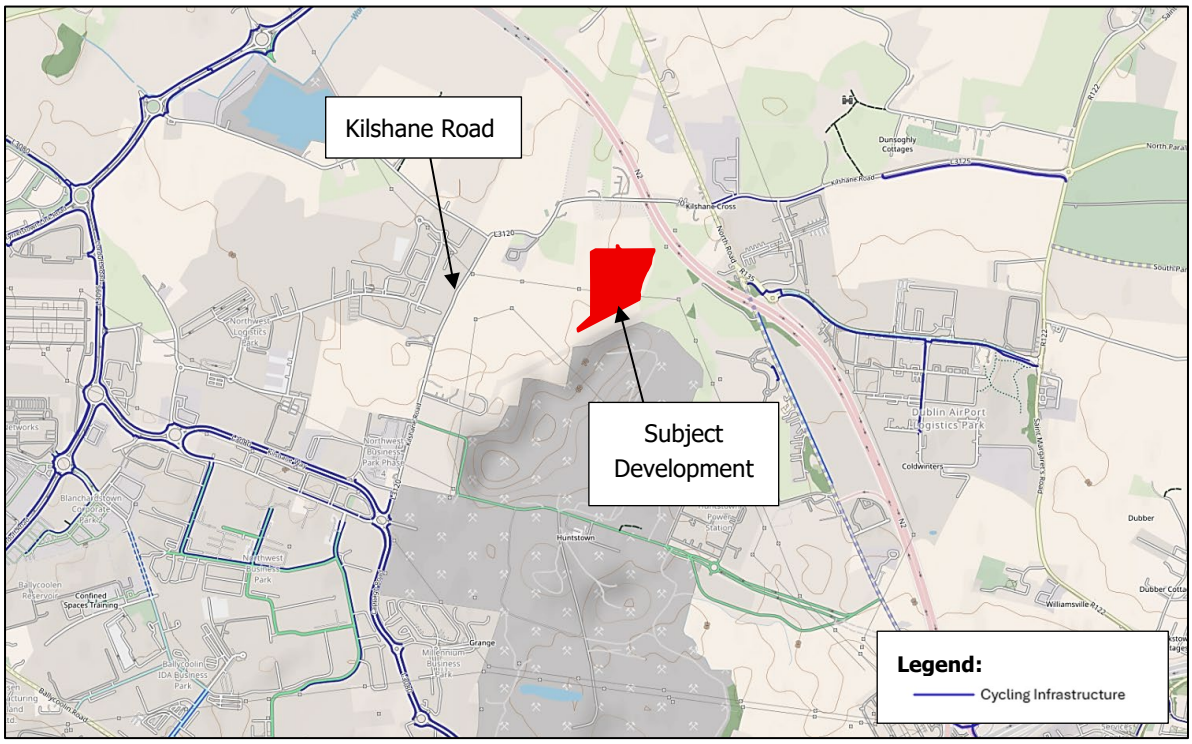
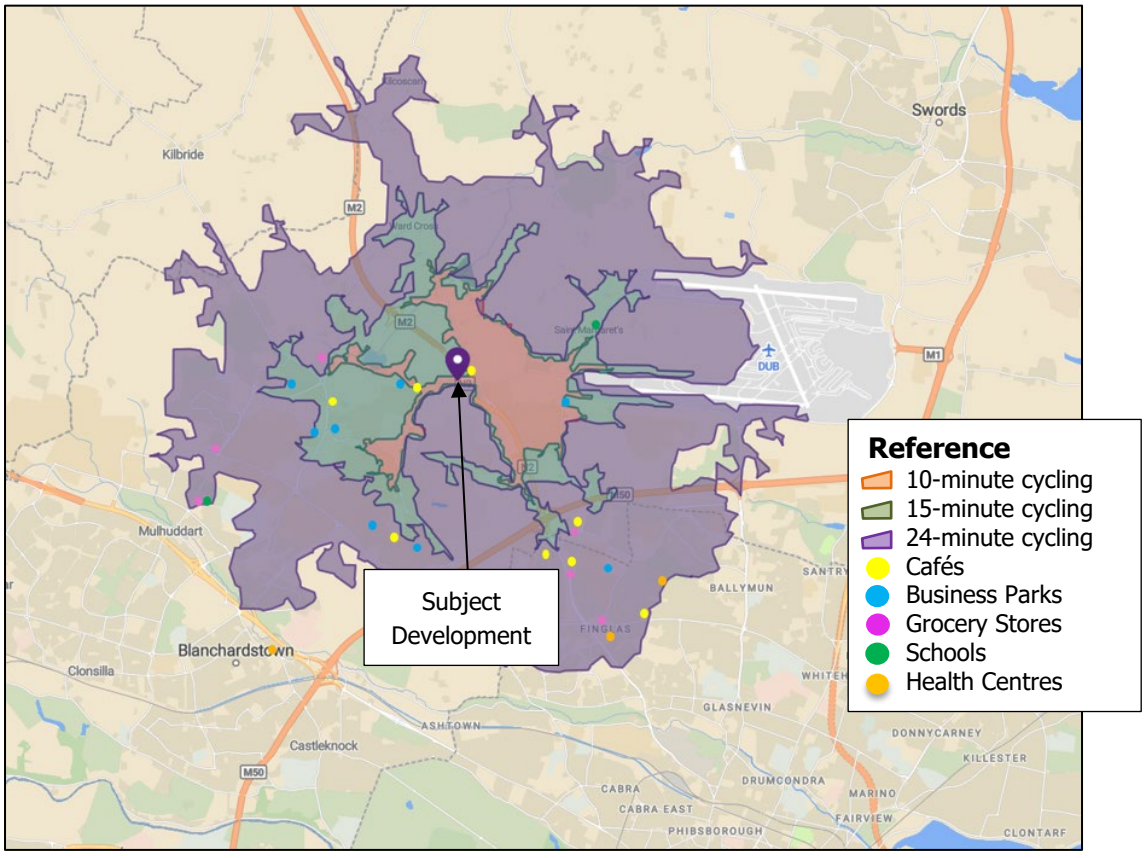


Figure 4-10 below illustrates the cycling catchment areas accessible from the subject development for 10, 15, and 24-minute cycle times.

Figure 4-10 Isochrone map indicating Cycling Accessibility (Source: Smappen)



The figure above illustrates that the 24-minute cycle catchment area includes provides access to amenities such as cafés, grocery stores, health centres and schools.

4.3.1.6 Transportation Improvements

4.3.1.6.1 BusConnects

The BusConnects project, currently being promoted by the National Transport Authority (NTA), aims to deliver a significantly improved bus service in the Greater Dublin Area (GDA). Some of the route improvements identified in the BusConnects plan are already in place or underway. According to BusConnects the above route types can be defined as follows:

- Spines routes: are very frequent routes made up of individual bus services that are timetabled to work together over their common sections.
- Radials routes: are other services that operate into Dublin city centre. These services are not part of any Spine and operate to their own timetable.
- Orbitals routes: provide connections between suburbs, without having to travel into the city centre.
- Local routes: provide connections to Local centres and link to onward transport connections.
- Peak routes operate during peak travel periods, providing additional capacity along key bus corridors.
- Express routes are direct services from outer suburbs to the city centre during peak hours, serving limited stops to get passengers to their destination faster.

The routes proposed to serve the surrounding area of the Subject Development are shown in Table 4-3 below, which also gives the route name and weekday and weekend frequency, and the map showing the location of each bus route is shown in Figure 4-11 below. The subject development is proposed to be served by route bus route L62 which is located at 1.6km (22 min walk) away from the Subject Site to the south.

Figure 4-11 BusConnects Route Map (Source: extracted from BusConnects Revised Network Map 2023)

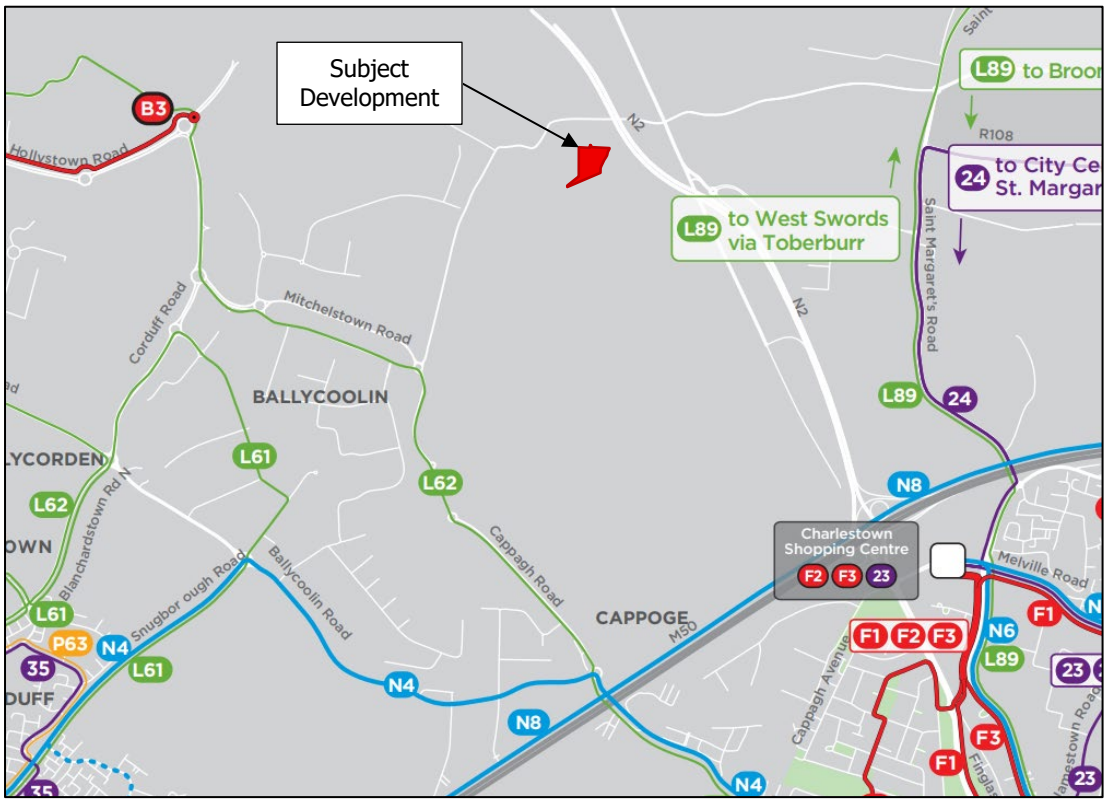


Table 4-3 BusConnects – Frequency service

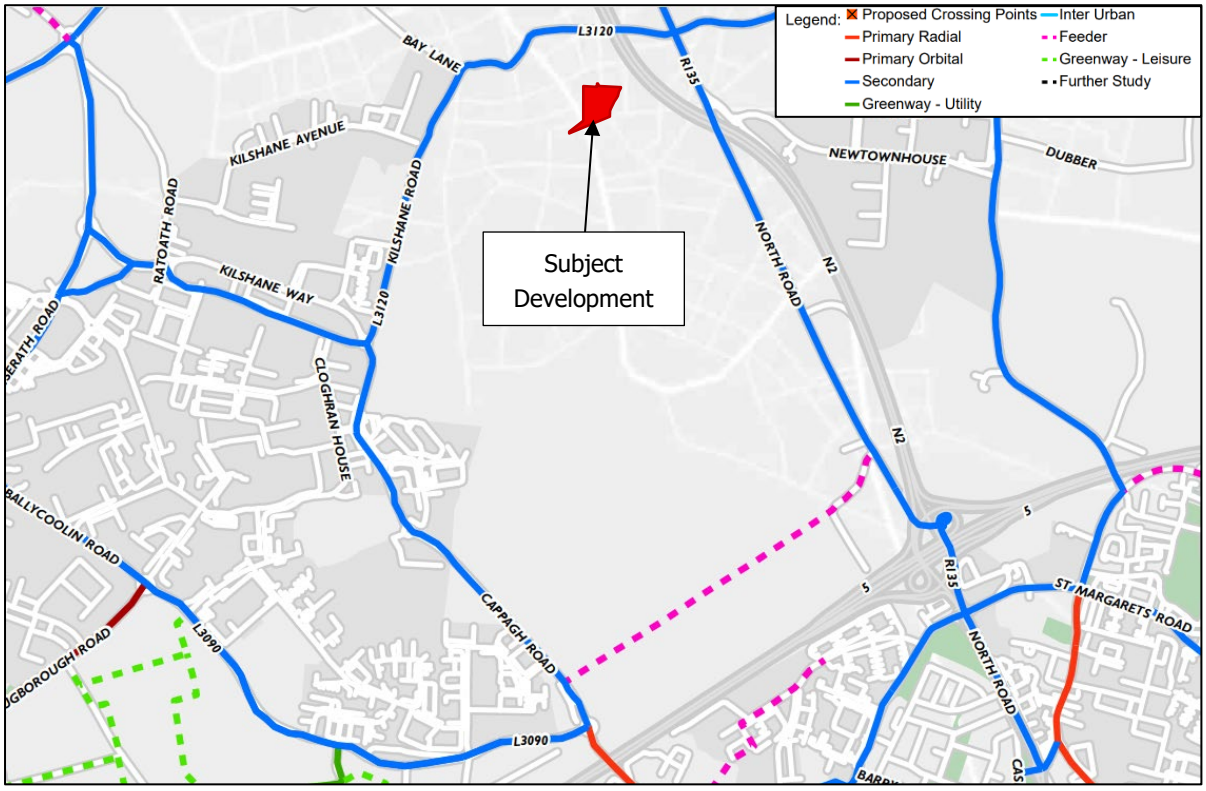
Route	Route Name	Frequency
Local Route L26	Kilternan – Cabinteely – Deansgrange – Blackrock	**Weekday:** Every 30 minutes between 6:00 and 22:00 Every 60 minutes between 22:00 and 6:00 **Saturday:** Every 60 minutes from 6:00 to 9:00 Every 30 minutes between 9:00 and 22:00 Every 60 minutes between 23:00 and 6:00 **Sunday:** Every 60 minutes between 8:00 and 10:00 Every 30 minutes between 10:00 and 23:00 Every 60 minutes between 23:00 and 8:00

4.3.1.6.2 Cycling Facilities

In January 2023 was adopted the Greater Dublin Area (GDA) Cycle Network Plan, consisting of the Urban Network, Inter-Urban Network and Green Route Network for each of the seven Local Authority areas comprising the GDA. This Plan was part of the GDA Transport Strategy 2022-2042.

An extract of the proposed cycle network is reproduced in Figure 4-12 below.

Figure 4-12 Proposed Cycle Network (Source: GDA Cycle Network Plan, 2022)



The future local cycle network, as outlined in the 2022 GDA Cycle Network Plan, includes a secondary route running along Kilshane Road. A secondary route is also proposed along the R135.

4.3.1.6.3 Local Network Improvements

Local network improvements are planned along Kilshane Road (L3120), as part of a broader development initiative associated with the approved Phase 1 of the project (Reg. Ref. ABP-317480-23).

The proposed upgrades include road improvement works to 493.34m Kilshane Road (L3120), including the realignment of a portion of the road (293.86m) within the subject lands boundary and the provision of new footpaths, off-road cycle ways, together with the construction of a new roundabout linking the proposed realignment of Kilshane Road back to the existing road network to the northeast of the subject lands and to the proposed internal road network to serve the Proposed Development.

Figure 4-13 Local Network Improvements



4.4 Characteristics of the Proposed Development

4.4.1 Construction Phase

The construction period for the subject development is expected to overlap with that of the approved Phase 1 development (Reg. Ref. ABP-317480-23). According to the TTA prepared by Waterman Moylan Consulting Engineers report No. 21-099r.011B included with the Planning Application for the Phase 1

development, the construction phase is expected to occur from 2025 to 2028. The proposed subject development's construction phase will occur from 2027 to 2029.

During the construction of Phase 1, the site will accommodate approximately 200 construction staff. Once Phase 2 construction commences, staffing levels are expected to increase by an additional 50 personnel, bringing the total number of construction staff on-site to 250 during the peak overlapping period.

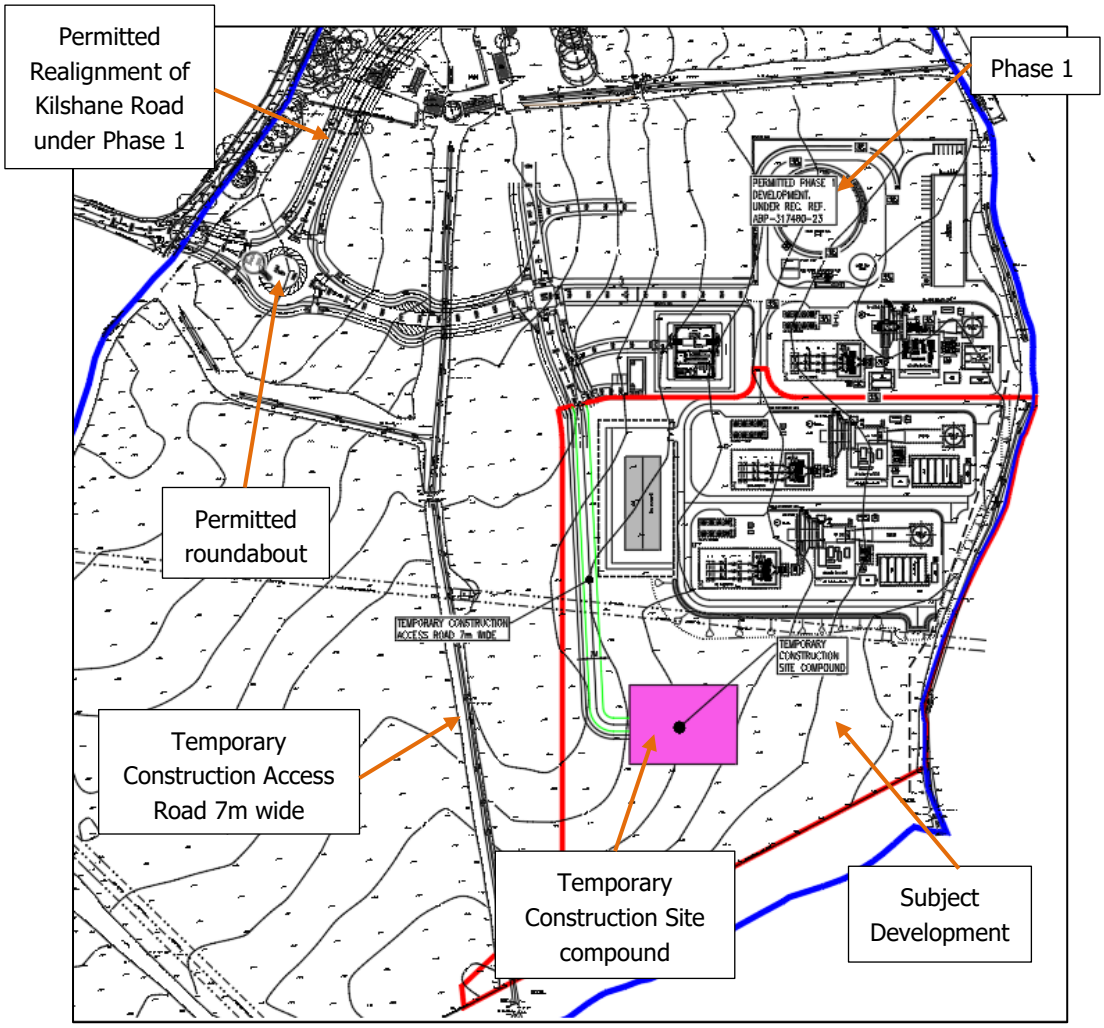
As indicated above, the site is currently poorly connected to public transport. Consequently, it is anticipated that staff will primarily commute to and from the development by personal vehicles, carpooling, or shuttle buses. Given the location of Subject Development and considering the worst-case scenario, it is assumed that 200 cars will arrive and depart during the peak hours (average vehicle occupancy of 1.25 people).

With regard to heavy goods vehicles, an estimate of the daily traffic movements associated with construction activities has been made based on experience of similar sites, assuming that the worst-case scenario for construction traffic will be during the excavation phase.

4.4.1.1 Construction Traffic Access

A temporary access road with a 7m carriage width has been proposed for construction traffic as shown in Figure 4-14 below.

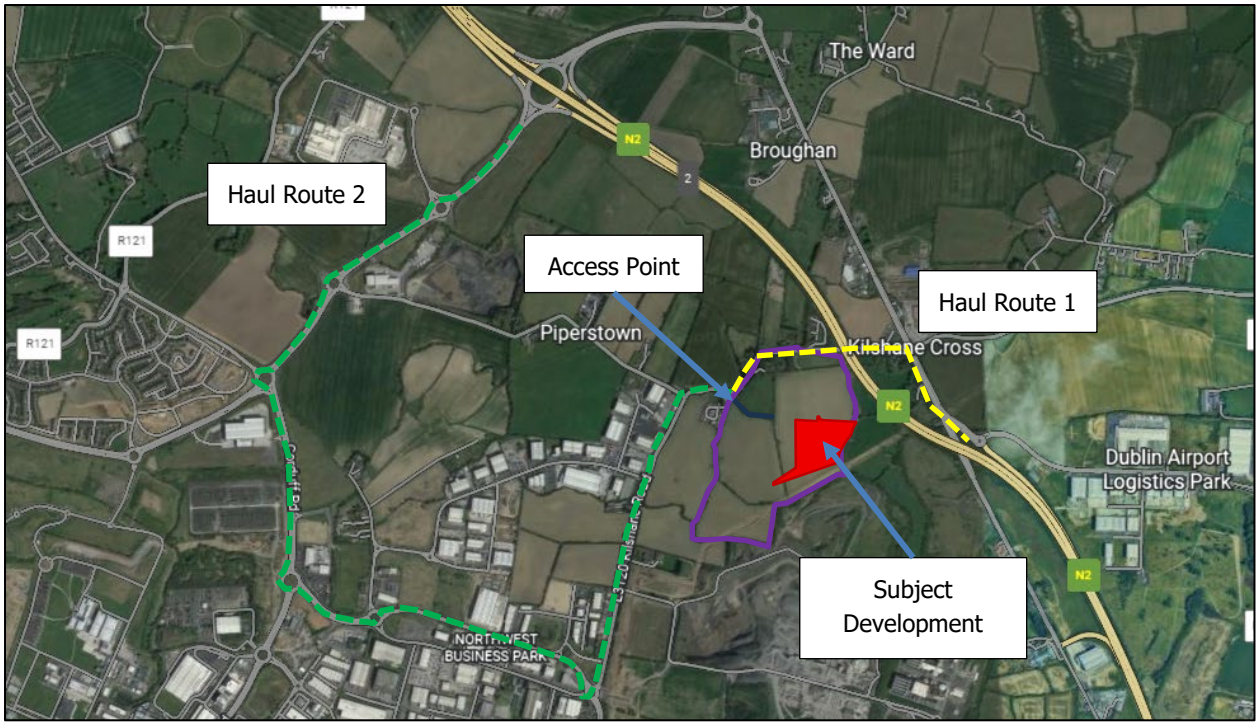
Figure 4-14 Construction Traffic Access



4.4.1.2 Primary Haul Routes

For the preliminary construction traffic management plan, there is no designated site for the excavated material to fill. This will be organised by the designated Contractor before construction. For the purposes of this Preliminary Construction Traffic Management Plan, haul routes to the N2 have been established.

Figure 4-15 Vehicular routes from the N2



4.4.1.2.1 Haul Route 1

Haul route 1 is the shortest route from the site to the N2 measuring 1.2km and it is relatively flat route with an exception of the N2 overpass. The haul route has a good quality carriageway measuring 7.5m along Kilshane Road with a pinch point towards Kilshane Cross Junction and on the N2 Overpass Bridge.

Table 4-4 Haul Route 1 – Advantages/Disadvantages

Route	Advantages	Disadvantages
Route 1	Shortest Route Generally flat route Little pedestrian movements in the area	Traffic Congestion at Kilshane Cross Junction Pinch Points along Kilshane Road and N2 Overpass N2 access is only for N2 South and access to N2 north is significantly longer travel distance.

4.4.1.2.2 Haul Route 2

Haul Route 2 is approximately 12km connecting to the N2 to the north of the proposed site. This haul route is significantly longer when compared to Haul Route 1. This route is longer due to the road network around the Proposed Development. Using Bay Lane would reduce the haul route distance however Bay Lane carriageway is approximately 3.5m and too narrow for HGVs to use daily. Bay Lane also lacks road markings, pedestrian pathways or street lighting.

Figure 4-16 Bay Lane



Therefore, the proposed haul route travels further south along Kilshane Road through Northwest Business Park to Corduff Park Road which connects to the N2. Corduff Road is a dual carriageway approximately 17m wide with pedestrian and cyclist pathways on both sides of the road separated by a grass verge.

Table 4-5 Haul Route 2 – Advantages/Disadvantages

Route	Advantages	Disadvantages
Route 2	Wider roads with fewer pinch points Connecting to both north and south directions for the N2 Less traffic congestion (avoids the busy Kilshane Cross Junction)	Longer haul route More pedestrian interference More junction interference Haul route through Northwest business park

4.4.1.3 Parking During Construction

According to Section 4.3.1.5, access from the site to existing public transport in the surrounding area is precarious and unsafe with no provision of continued footpaths. Consequently, it is anticipated that staff will primarily commute to and from the development by car.

A construction car park will be established at the commencement of the construction phase will serve as a parking area for vehicles belonging to the workforce. This will be situated within the construction site, thereby preventing any impact on the surrounding development area. No parking allowed on Kilshane Road or the surrounding developments.

4.4.2 Operational Phase

4.4.2.1 Development Description

The Proposed Development will consist of the following:

- 2 additional gas turbines producing 340MW each

- 400kV GIS building and associated compound
- Increasing diesel storage from 5000t to 15000t
- Extension to administration building
- Access roads
- Electrical substation

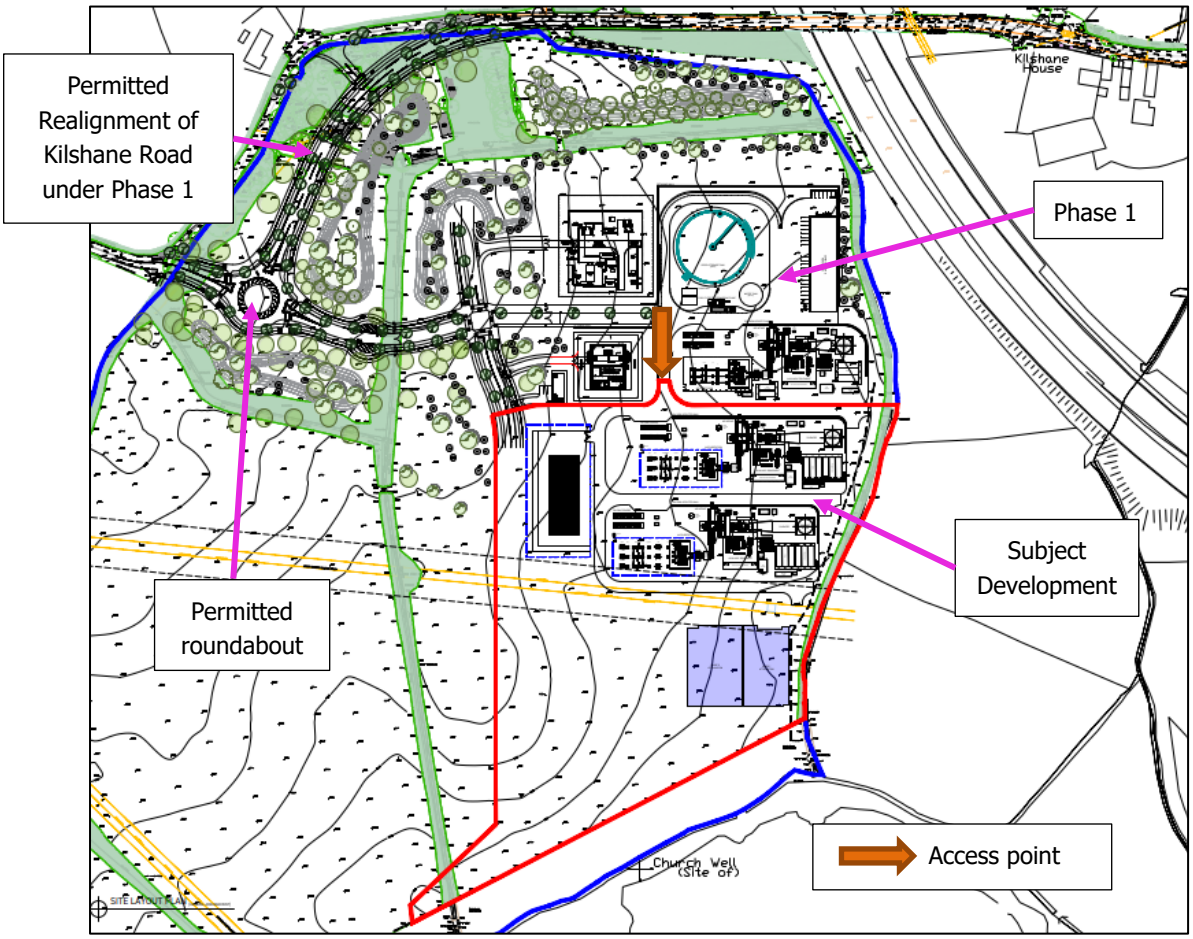
During the operational phase, it is anticipated that an average of 25–30 personnel will be working on-site daily. Additionally, a maximum of two Heavy Goods Vehicle (HGV) deliveries per day is expected, occurring approximately once per week. The projected maximum staffing level of 30 individuals comprises 25 staff members for Phase 1 and an additional 5 staff members for Phase 2. As both phases will utilise the same access point, the operational traffic assessment has been conducted based on this maximum staffing scenario to ensure a comprehensive evaluation.

4.4.2.2 Development Access Point

Vehicular access to the subject development will be provided via a new roundabout, connecting to the internal road to be provided in Phase 1 which is located immediately north of the subject site. This phase has received a notification to grant permission under Reg. Ref. ABP-317480-23. The permitted roundabout will also serve as the primary access point for pedestrians and cyclists.

The development access point is shown in Figure 4-17 below:

Figure 4-17 Proposed Development – Site Access Point



As part of the Phase 1 project, a section of Kilshane Road along the north-western boundary of the site is proposed to be realigned and upgraded. The upgraded road layout will include dedicated 2-metre-wide footpaths and 2-metre-wide cycle lanes on both sides of the carriageway.

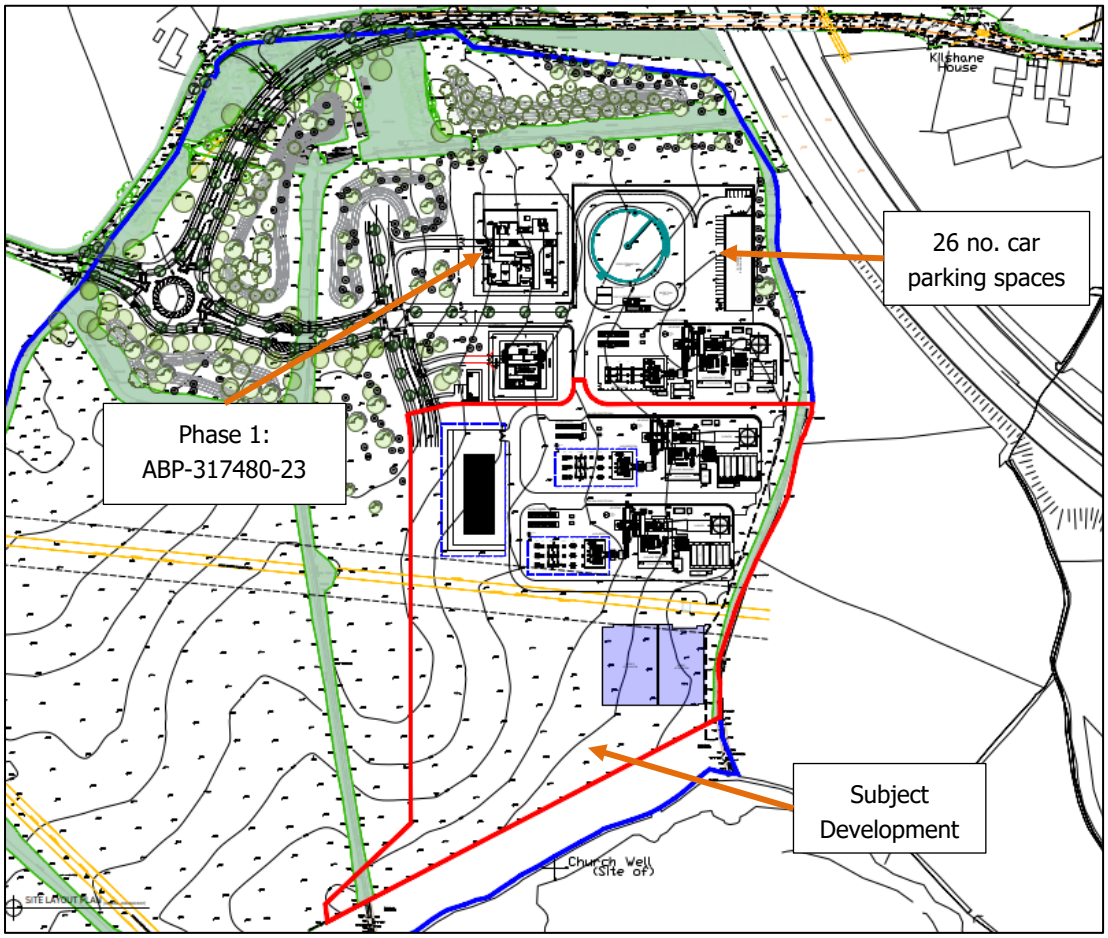
4.4.2.3 Car Parking Proposed

Car parking standards for general industrial development are provided in Table 14.19 of Fingal Development Plan (2023-2029). However, these standards are not applicable due the nature of the subject development.

According to the approved Travel Plan prepared as part of the planning application for Phase 1, it will only require 1-2 staff on average each day and up to 25 staff required on busiest days. The proposed subject development is expected to follow a similar pattern, with an average daily requirement of 1–2 staff and a maximum of 5 staff on the busiest days. Therefore 26 no. car parking spaces (including 1 no. disabled parking space and 2 no. EV charging points) proposed in the approved Phase 1 development are adequate.

Figure 4-18 shows the location of the car parking spaces.

Figure 4-18 Proposed Development – Location of car parking spaces



4.4.2.4 Bicycle Parking Proposed

Cycle parking standards for general industrial development are provided in Table 14.17 of Fingal Development Plan (2023-2029). However, these standards are not applicable due the nature of the subject development.

The Proposed Development will utilise the 20 no. sheltered bicycle parking spaces included as part of the Phase 1 planning application (Reg Ref. ABP-317480-23).

Given the low number of staff expected on-site (approx.1–2) on a typical day and up to 5 on the busiest days, this provision is considered sufficient. Furthermore, the absence of dedicated cycling infrastructure along Kilshane Road limits the likelihood of significant demand for cycling as a primary mode of commuting.

4.5 Potential Impacts of the Proposed Development

4.5.1 Construction Phase

There is potential for construction traffic to generate noise and dust effects on the surrounding road network. Construction deliveries to and from the site by heavy good vehicles will impact on noise levels, whilst dust will result from vehicles travelling along site roads and from general earthwork activities.

There is also potential for traffic congestion, particularly during the construction of the upgraded junction and also due to increased construction traffic on the road network which will also perform turning movements in areas that impact traffic.

A number of construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

There is potential for construction traffic to have a ***moderate negative*** effect on the surrounding environment. However, these effects will be of ***short-term*** duration (i.e. one to seven years).

To assess the impact of construction-related traffic flows, this section estimates the number of trips to and from the construction site, estimates the potential distribution of traffic, and assesses the likely effects on the existing road network.

Trip Generation:

As indicated above, the construction period for the subject development is expected to overlap with that of the approved Phase 1 development (Reg. Ref. ABP-317480-23).

With regard to heavy goods vehicles, an estimate of the daily traffic movements associated with construction activities has been made based on experience of similar sites, assuming that the worst-case scenario for construction traffic will be during the excavation phase. Determination of the construction traffic movements is based on the assumptions set out below:

- Construction Work Schedule: The normal working week is 39 hours worked over five days between Monday and Friday each week. Normally Monday-Thursday from 07:00 to 17:00, with a minimum of 8 working hours, and Friday from 7:00 to 4:00, with a minimum of 7 working hours.1
- This assessment assumes that workers should arrive on site before 07:00 and leave after 16:00.
- This report assumes that HGV movements will occur from 07:30 to 16:00.
- Conservatively assuming removal trucks will operate Monday – Friday only.
- 20 working days per month.
- Preliminary calculations for the excavation required by the Proposed Development indicate a total volume of 63.856 m³. Refer to Waterman Moylan Drawing No. KPS-WMC-PH1-00-DR-C-P150 for details. It is assumed that excavation for the approved Phase 1 development will be completed prior to the commencement of the current development.
- Carrying capacity of trucks is 15m^3.
- Peak hours on the road network occur from 08:00 to 09:00 in the morning and from 17:00 to 18:00 in the evening.

It is estimated that the Subject Site will generate a total of 4,257 two-way trips over a 160-day period (approximately eight months) during the excavation phase. This gives an average of 26 truck arrivals and 26 truck departures per working day. Additional HGV movements for stone deliveries and large concrete pours are expected to vary between 5 and 10 two-way traffic flows per day. Therefore, during the excavation phase, a total of approximately 31 to 36 HGV movements per day is anticipated. For the purposes of this assessment, it is assumed that 5 two-way HGV movements will occur during the AM peak hour, with the remaining movements distributed throughout the rest of the working day.

The general workforce is expected to be approximately 250 people per day. As indicated above, the site is currently poorly connected to public transport. Consequently, it is anticipated that staff will primarily commute to and from the development by personal vehicles, carpooling, or shuttle buses. Given the location of Subject Development and considering the worst-case scenario, it is assumed that 200 cars will arrive and depart during the peak hours (average vehicle occupancy of 1.25 people).

[1] Construction Sector - Workplace Relations Commission: https://www.workplacerelations.ie/en/what_you_should_know/hours-and-wages/sectoral%20employment%20orders/construction-sector/

The estimated distribution of inbound traffic to the Construction Site is as follows:

- 80% (160 trips) of the inbound traffic generated by the construction site will be between 06:00 and 07:00.
- 10% (20 trips) of the inbound traffic generated by the construction site will be between 07:00 and 08:00.
- 5% (10 trips) of the inbound traffic generated by the construction site will be between 08:00 and 09:00.
- 5% (10 trips) of the inbound traffic generated by the construction site will be after 09:00.

As indicated above, it is assumed that workers will leave the site after 16:00, and based on experience from similar construction projects, the estimated distribution of outbound traffic to the Construction Site is as follows:

- 80% (160 trips) of the outbound traffic generated by the construction site will be between 16:00 and 17:00.
- 20% (40 trips) of the outbound traffic generated by the construction site be between 17:00 and 18:00.

The trips generated are shown in the table below.

Table 4-6 Subject Development Trip Generation - Construction Phase

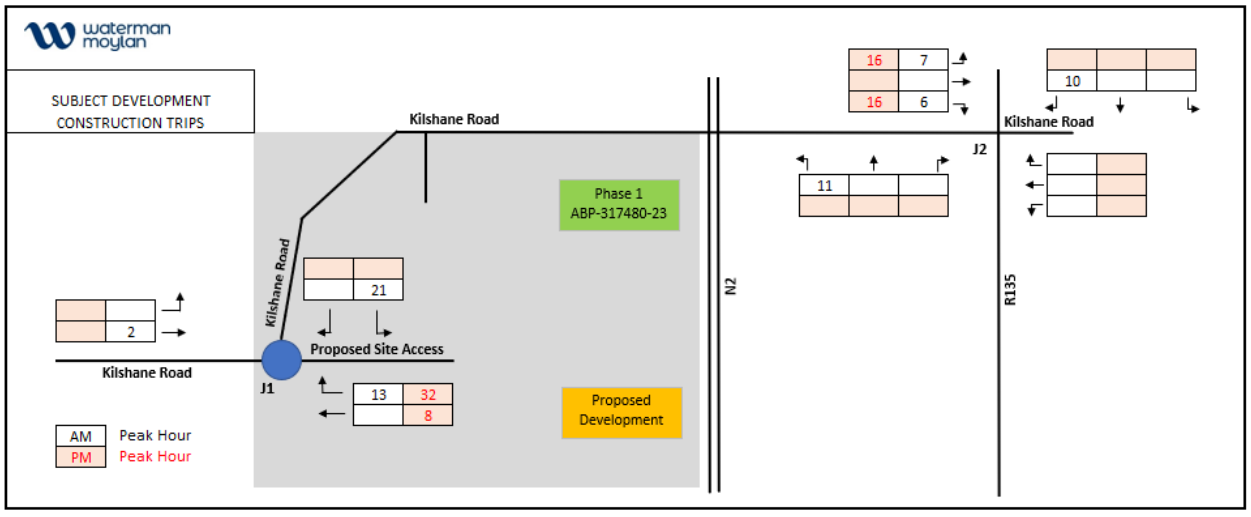
	AM Peak Hour (08:00 - 09:00)		PM Peak Hour (17:00 - 18:00)	
	Arrivals	Departures	Arrivals	Departures
Construction Traffic	23	13	0	40

In table above, the 5 two-way HGV movements have been expressed in PCU (1 HGV = 2.5 PCU).

Trip Distribution:

It is assumed that approximately 80% of workers will commute via the N2, with 40% travelling through Junction 2, located to the north of Kilshane Road, and 40% using the free-flow slip road from the N2 northbound, situated to the south of Kilshane Road (refer to **Figure 4-4** above). These workers will then proceed via Kilshane Road from the north of the permitted roundabout. The remaining 20% are expected to arrive from the west from the N3 or residential areas located to the east of the proposed site. As construction personnel are expected to remain on-site throughout the day, AM peak departures will primarily consist of HGVs. The same directional distribution is anticipated for the PM peak period.

Figure 4-19 Subject Development Trip Assignment - Construction Phase



4.5.2 Operational Phase

During the operational stage, there is potential for noise and dust emissions to affect the surrounding road network. Additionally, staff-related traffic, including inbound and outbound movements, will contribute to localised congestion, particularly during peak travel periods.

The proposed site includes a comprehensive provision of parking spaces, which is expected to accommodate all staff vehicles. Therefore, it is unlikely that staff will need to park outside designated areas, minimising the risk of off-site parking impacts.

These operational impacts are anticipated to result in not significant, negative, long-term effects on the surrounding road network.

To assess the impact of operation-related traffic flows, this section provides: An estimate of the number of trips to and from the site, an analysis of traffic distribution patterns, and an evaluation of the potential effects on the existing road network.

Below is the information for the operational phase provided by the developer which was used to estimate the operational traffic to/from the development.

- Average and maximum number of staff: 25-30 people.
- Average and maximum number of daily HGV deliveries: average of 1-2 per week.

It is worth noting that the maximum number of 30 staff comprises of 25 no. staff for Phase 1 and 5 no. It is worth noting that the maximum number of 30 staff comprises of 25 no. staff for Phase 1 and additional 5 no. staff for the Phase 2, subject development. As both phases share the same access point, operational traffic has been assessed based on this maximum staffing level.

In order to carry out a conservative assessment of the surrounding road network during the operation phase, all the staff members will travel to/from the site in their personal cars. It is also assumed that the HGV deliveries will be scheduled outside of the peak hours. Thus, trips generated during the operation phase are shown below.

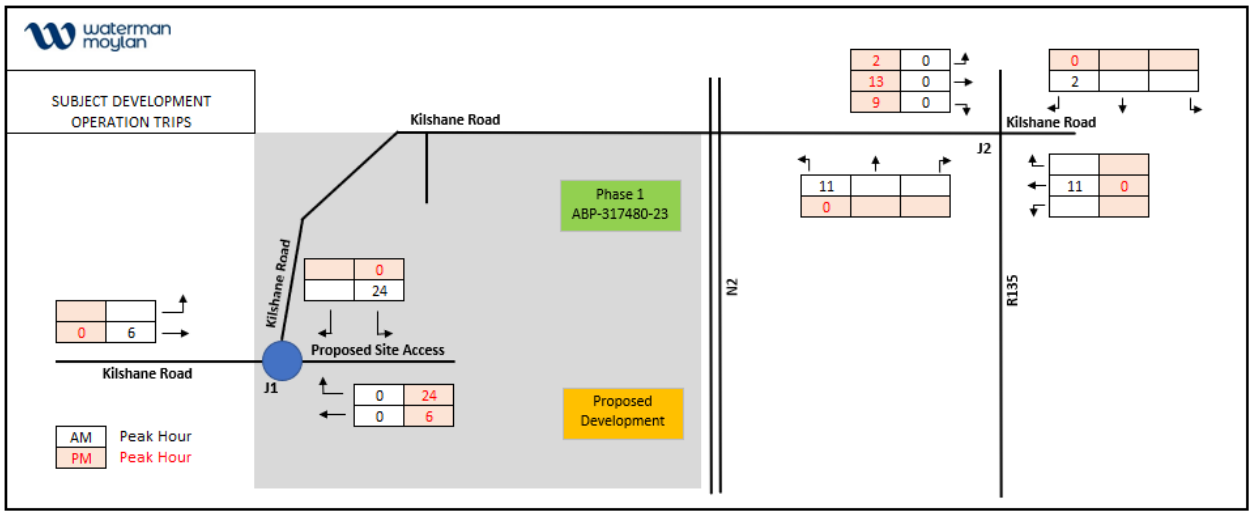
Table 4-7 Subject Development Trip Generation - Operation Phase

	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Operation Traffic	30	0	0	30

Trip Distribution:

It is assumed that approximately 80% of staff will commute via the N2, with 40% travelling through Junction 2, located to the north of Kilshane Road, and 40% using the free-flow slip road from the N2 northbound, situated to the south of Kilshane Road (refer to Figure 4-4 above). These workers will then proceed via Kilshane Road from the north of the permitted roundabout. The remaining 20% are expected to arrive from the west from the N3 or residential areas located to the east of the proposed site. The same directional distribution is anticipated for the PM peak period.

Figure 4-20 Subject Development Trip Assignment - Operation Phase



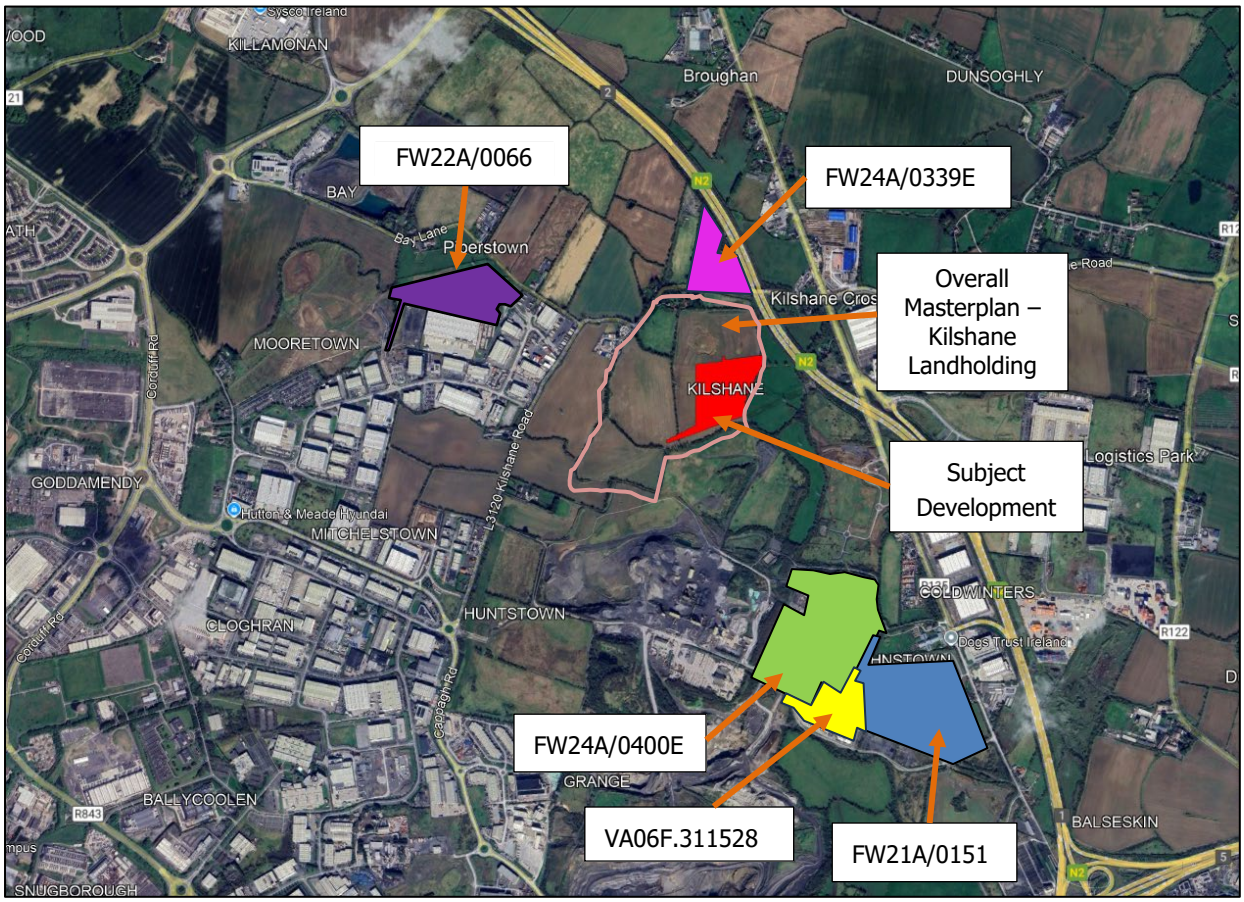
It has been assumed that, on the busiest day, a maximum of 30 staff will be present, comprising of 25 staff for Phase 1 and an additional 5 staff for Phase 2. As both phases share the same access point, operational traffic has been assessed based on this maximum staffing level.

4.5.3 Committed and Potential Developments

To provide a robust and cumulative assessment of local road network, nearby developments that are likely to have an impact on the local road network, have also been assessed in this TTA with regards to trip generation and additional traffic. The location of these developments is shown in

Figure *4-21* below:

Figure 4-21 Location of committed developments



Huntstown Battery Energy Storage System: FW24A/0400E

The committed Huntstown Battery Energy Storage development is located south of this subject site and received a notification to grant permission in May 2025. The development comprises a Battery Energy Storage System facility to include up to 85 no. containerised battery storage modules on concrete bases, 20 no. transformer and power conditioning units, cable racks, and associated lighting.

Construction is expected to start in 2026 and run for 15-27 months, therefore overlapping with the construction phase of the subject development. It is not expected that this development will add additional traffic flows to the existing road network after the construction phase is concluded.

Trip generation has been obtained from the approved Construction Traffic Management Plan prepared by Mott Macdonald as part of the Huntstown Battery Energy Storage planning application. The calculated trips are reproduced in the table below.

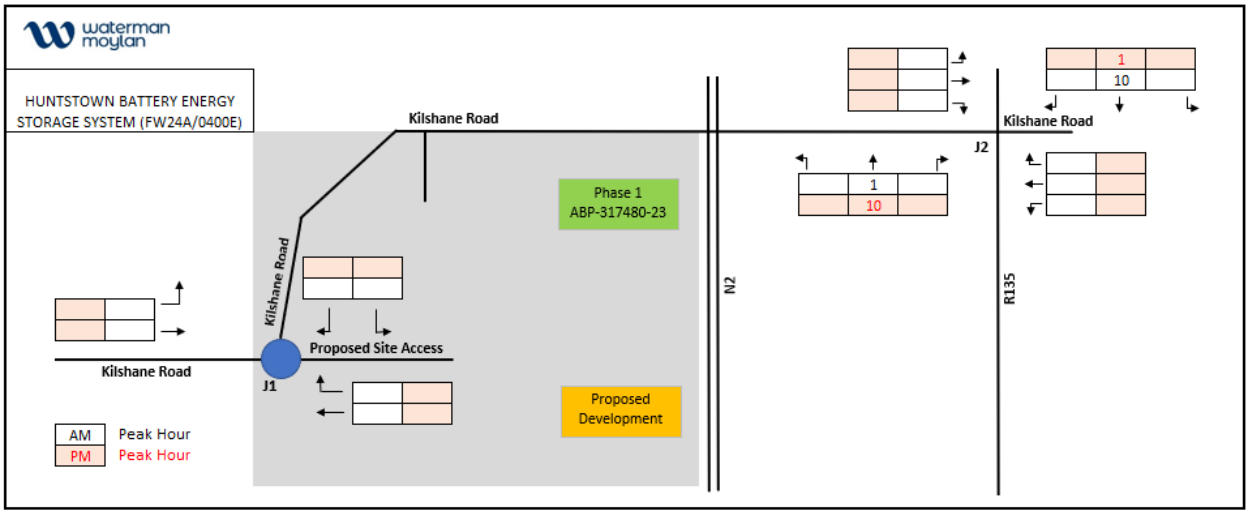
Table 4-8 AM & PM Peak Hours Trip Generation – Huntstown Battery Energy Storage

Huntstown Battery Energy Storage	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Construction Traffic	31	3	3	31

The trip distribution has been derived from the Construction Traffic Management Plan prepared by Mott MacDonald. The report indicates that construction vehicles will utilise the existing Huntstown Power Station

access on North Road. North Road and the R135 can be accessed from the south (Dublin direction) via the N2, or from the north via the M2 Junction 2 (Cherryhound Interchange). For the purposes of this assessment, it is assumed that a proportion of traffic travelling along the R135 will continue straight ahead at the R135 and Kilshane Road junction. The traffic distribution is illustrated in Figure 4-22 below.

Figure 4-22 Committed Development - Huntstown Battery Energy Storage System: (FW24A/0400E)



Shipping Container Depot at Kilshane: FW24A/0339E

The committed shipping container depot development is located north of this subject site and received a notification to grant permission under Reg. Ref. ABP-321196-24.

Operational traffic from the approved Engineering Assessment Report prepared by Waterman Moylan has been used to obtain trips generated by this development. The trips are reproduced in the table below.

Table 4-9 AM & PM Peak Hours Trip Generation – Shipping Container Depot

Shipping Container Depot	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Operational traffic	15	15	15	15

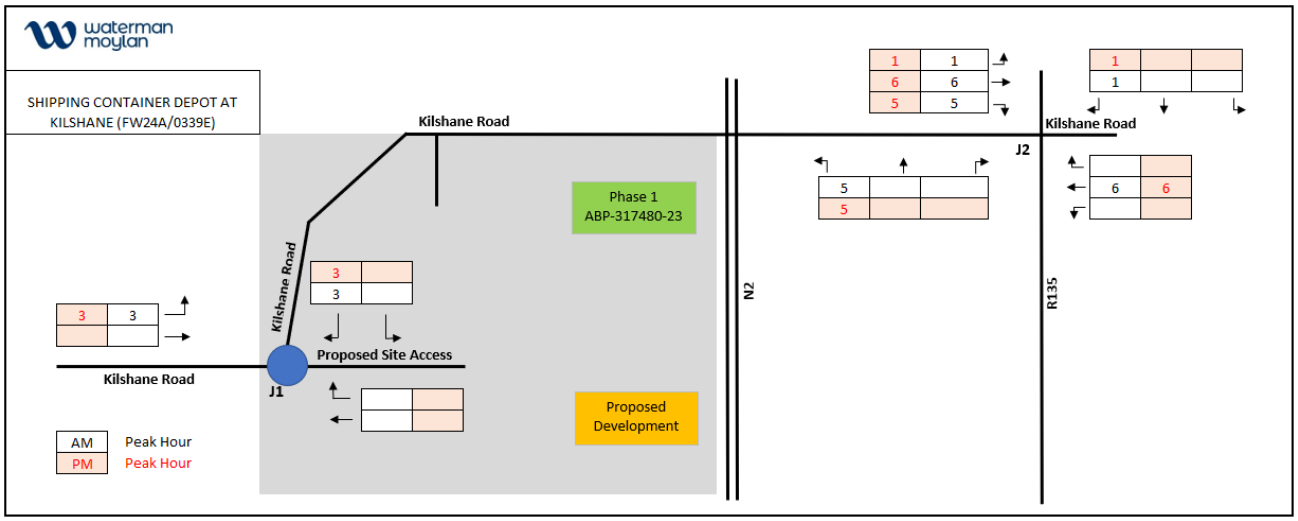
It is anticipated that this development will be operational at the commencement of the construction phase of the subject development

The trip distribution was extracted from Engineering Assessment Report prepared by Waterman Moylan. This report indicates that 80% of outbound vehicles will travel east along Kilshane Road (L3120) towards the N2 & M50, while the remaining 20% will travel west along Kilshane Road (L3120) towards Blanchardstown and the M3 motorway.

Trip distribution at Junction 2 is proposed to follow the same patterns observed in the surveyed traffic flows (refer to Section 4.3.1.4 above).

Traffic flow distribution is presented in Figure 4-23 below.

Figure 4-23 Committed Development - Shipping Container Depot at Kilshane (FW24A/0339E)



High Technology Manufacturing Unit: FW22A/0066

The committed High Technology Manufacturing Unit development is located southwest of this subject site adjacent to Bay Lane. It received a notification to grant permission in July 2022. The lands are to be accessed directly from Kilshane Road via Bay Lane.

The Proposed Development comprises the construction of a high technology manufacturing unit (for the manufacturing of high technology electrical components), with a total gross floor area (GFA) of 23,600 sq.m (including ancillary office space of 2,318 sq.m. at ground and first floor levels), and with a main parapet height of c. 12 metres and maximum height of 14.5 metres.

It is anticipated that this development will be operational at the commencement of the construction phase of the subject development.

Trip generation has been obtained from Chapter 12 of the approved Environmental Impact Assessment Report prepared by AWN Consulting as part of the proposed High Technology Manufacturing Unit planning application. The trips are reproduced in the table below.

Table 4-10 AM & PM Peak Hours Trip Generation – High Technology Manufacturing Unit

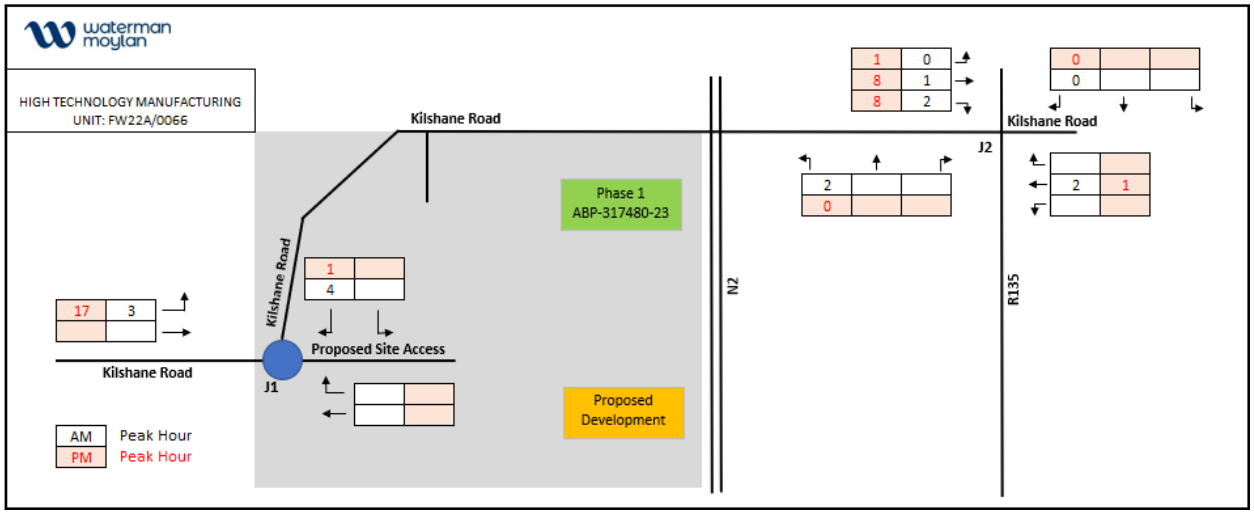
High Technology Manufacturing Unit	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Operational traffic	81	17	16	86

The trip distribution was extracted from the Environmental Impact Assessment Report (EIAR) prepared by AWN Consulting. According to the information provided in the document, trips to and from the committed developments will be distributed along the internal road network within the industrial park located to the west of the subject site. A small proportion of trips will travel via Kilshane Cross and will be reflected at the assessed junctions. Further details are provided in Appendix D, pages 8 and 18 of the EIAR.

In addition, trip distribution at Junction 2 is proposed to follow the same patterns observed in the surveyed traffic flows (refer to Section 4.3.1.4 above).

The traffic flow distribution is illustrated in Figure 4-24 below.

Figure 4-24 Committed Development - High Technology Manufacturing Unit (FW22A/0066)



Huntstown Data Hall: FW21A/0151

The committed development Huntstown Data Hall is located south of this subject site. It received a notification to grant permission in March 2025.

The Proposed Development comprises the construction of 2 no. data hall buildings (Buildings A and B) comprising data hall rooms, mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, outdoor staff areas, loading bays and docks, associated plant throughout, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout.

According to the approved EAR, the construction of this data hall will run from 2024 to 2027. Therefore, this development will be operational at the commencement of the construction phase of the subject development.

Trip generation has been obtained from Chapter 13 of the approved Environmental Impact Assessment Report prepared by AWN Consulting as part of the proposed High Technology Manufacturing Unit planning application. At operational stage, the site will be run on a 24-hour basis with varying shifts.

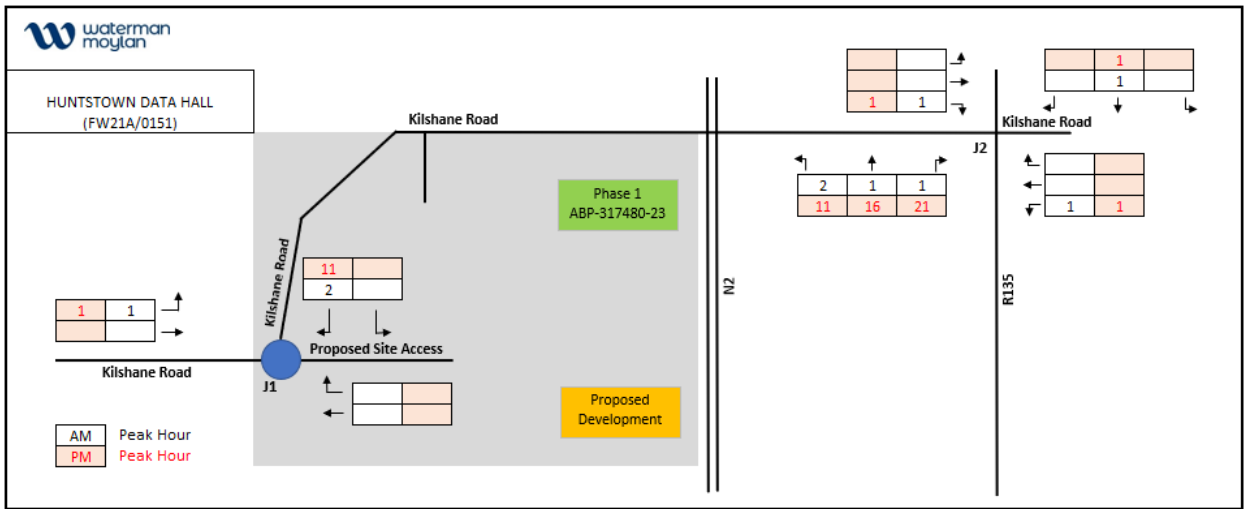
The trips are reproduced in the table below.

Table 4-11 AM & PM Peak Hours Trip Generation – Huntstown Data Hall

Huntstown Data Hall	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Operational traffic	8	8	4	157

The trip distribution was extracted from the Environmental Impact Assessment Report prepared by AWN Consulting and is presented in Figure 4-25 below.

Figure 4-25 Committed Development - Huntstown Data Hall (FW21A/0151)



220Kv Gas Insulated Switchgear – VA06F.311528

The committed development comprises a two-storey 220kV Gas Insulated Switchgear (GIS) substation to be known as 'Mooretown' with a total gross floor area of 2,068m2 and overall height of 17m – 20m, 5 no. 20kV switchgear buildings, a series coil and 1 no. 20kV control room building, underground cabling and all associated and ancillary site works.

It received a notification to grant permission in March 2025. According to the approved EIAR prepared by AWN Consulting, the construction phase was expected to run from 2021 to 2023. For the purpose of this assessment, it is assumed that construction will commence in late 2025, therefore overlapping with the construction phase of the subject development.

Trip generation has been obtained from Chapter 13 of the approved Environmental Impact Assessment Report prepared by AWN Consulting as part of the proposed 220kV gas insulated switchgear (GIS) planning application.

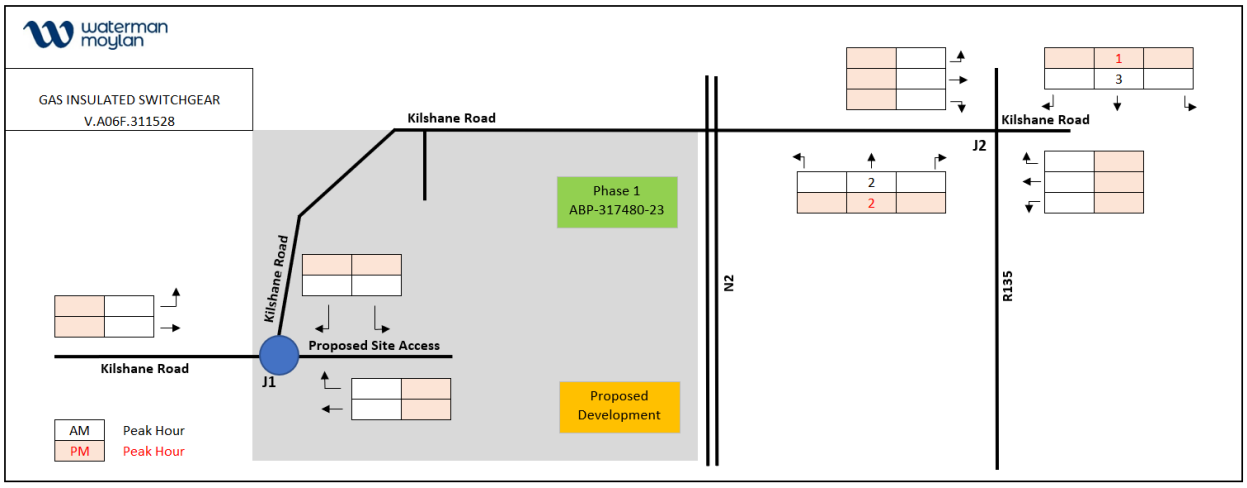
The trips are reproduced in the table below:

Table 4-12 AM & PM Peak Hours Trip Generation – 220kV Gas Insulated Switchgear

220kV Gas Insulated Switchgear	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Construction traffic	8	5	3	6

The trip distribution was extracted from the Environmental Impact Assessment Report prepared by AWN Consulting and is presented in Figure 4-26 below.

Figure 4-26 Committed Development - 220Kv Gas Insulated Switchgear – VA06F.311528



Overall Site Masterplan

The subject application for the power station is included in a masterplan, according to the approved Phase 1 planning application under Reg. Ref ABP-317480-23. The overall masterplan to be developed in 28.34ha lands includes the construction of several industrial units in line with the Fingal County Council Zoning. Figure 4-27 below shows the overall site masterplan extracted from the approved Phase 1 planning application.

Figure 4-27 Masterplan Site – Extracted from approved Phase 1 planning application (Reg. Ref. ABP-317480-23)



Table 4-13 below shows the masterplan schedule of accommodation. The masterplan includes the gas turbine power station and 11 industrial commercial units. The proposed site access for the subject application has been designed to accommodate the masterplan.

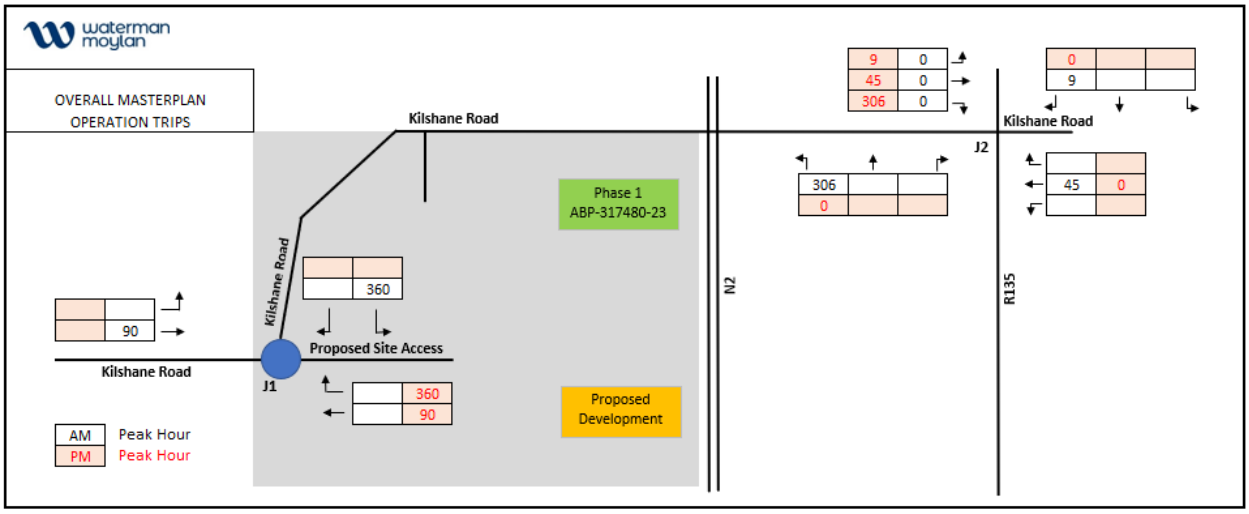
Table 4-13 Masterplan Schedule of Accommodation

Building	GFA (sqm)		Car Parking Provided*	
Unit 1	2,800	28	Unit 1	2,800
Unit 2	3,400	40	Unit 2	3,400
Unit 3	4,000	40	Unit 3	4,000
Unit 4	6,500	71	Unit 4	6,500
Unit 5	6,500	65	Unit 5	6,500
Unit 6	3,400	40	Unit 6	3,400
Unit 7	3,400	38	Unit 7	3,400
Unit 8	6,500	66	Unit 8	6,500
Unit 9	3,900	40	Unit 9	3,900
Unit 10	1,200	12	Unit 10	1,200
Unit 11	1,000	10	Unit 11	1,000
Total	**42,600**	**450**	**Total**	**42,600**

According to the approved Phase 1 planning application under Reg. Ref ABP-317480-23, the overall site masterplan is expected to have at least 500+ employees with a car being the primary method of transport to the site. It is estimated that the masterplan lands will generate 450 trips inbound during the AM peak hour and 450 trips outbound in the PM peak hour. This is based on the number of car parking spaces provided. It is assumed that the masterplan lands will be developed and operational by 2040.

The trip distribution was extracted from the Traffic and Transport Assessment by Waterman Moylan and is presented in Figure 4-28 below.

Figure 4-28 Overall Site Masterplan



4.5.4 Traffic impact

4.5.4.1 Construction Phase

The TII document *Traffic and Transport Assessment Guidelines (2014)* provides thresholds in relation to the impact of a Proposed Development on the local road network. The TII document indicates that the impact of new developments is considered to be significant if the level of traffic generated by them exceeds the thresholds of 10% for normal operating networks and 5% for congested networks. When such levels of impact are generated, a more detailed assessment should be carried out to determine the specific impact on the operational performance of the network.

A summary of the comparison between the base year two-way traffic flows (refer to Section 4.3.1.4 above) and the construction traffic flows (refer to Figure 4-13 above) at each studied junction is presented in Table 4-14 below.

Table 4-14 Existing and Expected Two-way Flows – Construction Phase

Junction	Junction Base Year Flow - AM Peak Hour	Junction Base Year Flow - PM Peak Hour	Additional Traffic Two-way Flow (AM)	Additional Traffic Two-way Flow (PM)	% Expected Increase (AM)	% Expected Increase (PM)
1	1,159	953	36	40	3%	4%
2	2,059	1,937	34	32	2%	2%

As shown in the table above, during construction phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour, representing ***neutral*** and ***not-significant*** alterations to the junctions.

Therefore, no further traffic assessment is deemed necessary for the construction phase of the subject development.

4.5.4.2 Operational Phase

As indicated for the construction phase The TII document *Traffic and Transport Assessment Guidelines (2014)* provides thresholds in relation to the impact of a Proposed Development on the local road network. The TII document indicates that the impact of new developments is considered to be significant if the level of traffic generated by them exceeds the thresholds of 10% for normal operating networks and 5% for congested networks. When such levels of impact are generated, a more detailed assessment should be carried out to determine the specific impact on the operational performance of the network.

A summary of the comparison between the base year two-way traffic flows (refer to Section 4.3.1.4 above) and the operation traffic flows (refer to Figure 4-20 above) at each studied junction is presented in Table 4-15 below.

Table 4-15 Existing and Expected Two-way Flows – Operation Phase

Junction	Junction Base Year Flow - AM Peak Hour	Junction Base Year Flow - PM Peak Hour	Additional Traffic Two-way Flow (AM)	Additional Traffic Two-way Flow (PM)	% Expected Increase (AM)	% Expected Increase (PM)
1	1,159	953	30	30	3%	3%

2	2,059	1,937	24	24	1%	1%

As shown in the table above, during operation phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour, representing ***neutral*** and ***not-significant*** alterations to the junctions.

Therefore, no further traffic assessment is deemed necessary for the operational phase of the subject development.

4.6 Mitigation Measures

4.6.1 Construction Phase

The main contractor as part of their site set up arrangements, shall appoint a Coordinator responsible for the implementation of a Construction Stage Mobility Management Plan and shall carry out the following tasks as part of its role:

- Encourage staff to avoid using of their cars and use alternative modes of transport in order to reduce the number of cars on the road and the need of car parking spaces.
- Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers.
- Update the public transport information adjacent to the development on an ongoing basis.
- Advise company staff of tax incentives for public transport and bicycles.

A limited number of car parking spaces will be provided for senior construction managers within the development site. Suitable locations in the surrounding area will be identified where staff can park and link to public transportation.

For those wishing to cycle to and from the site, dedicated cycle parking will be provided for the duration of the works within the site. Shower facilities and lockers will also be provided.

A detailed Construction and Traffic Management Plan will be prepared by the contractor and agreed with the Local Authority before commencing works on site, which must describe the following:

- Dedicated construction haul routes, which will be identified and agreed upon with the local authority before the commencement of construction activities on site.
- A dedicated "construction site"' access/egress system to be implemented during the construction phases.
- Manage the entry and exit of heavy vehicles to and from the site. The assignment of staff to assist pedestrians and traffic flow when heavy vehicle movements occur on the roads.
- Define schedules for the entry and exit of materials and machinery to limit the generation of noise on the network to specific time slots.

Adequate signposting will be located on-site to ensure the safety of all road users and construction workers.

All heavy vehicles spilling solid material on the road must cover the material to prevent dust being thrown onto the road.

All vehicles should wash their wheels, when necessary, when leaving the site to prevent dust being thrown onto the road.

Hoarding will be set up around the perimeter to prevent pedestrian access.

A material storage zone will also be provided in the Construction Compound area. This storage zone will include material recycling areas and facilities.

The contractor will be obliged to ensure that any sub-contractors engaged on the site are made fully aware of the required mitigation measures and that they are properly implemented as part of any works that they undertake.

The coordinator responsible for the implementation of a Construction Mobility Management Plan will carry out the following (but not limited to):

- Encourage staff to avoid using of their cars and use alternative modes of transport in order to reduce the number of cars on the road and the need of car parking spaces.
- Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers.
- Update the public transport information adjacent to the development on an ongoing basis.
- Advise company staff of tax incentives for public transport and bicycles. For those wishing to cycle to and from the site, dedicated cycle parking will be provided for the duration of the works within the site. Shower facilities and lockers will also be provided.

The following must be noted and implemented during the construction stage:

Measures to Minimise Nuisance

The measures, which are proposed to be operational at this site will include:

- Use of a properly designed access and egress to minimise the effects on both external traffic and local amenity.
- Check on each arriving and departing vehicle at the site entrance from the public street.
- Use of banksman, where necessary, to control exit of construction vehicles onto public road.
- Issue of instructions and maps clearly setting out the construction traffic route to the site to each sub-Contractor to ensure that all contractors are clearly briefed on the route to/from the site.
- Ongoing assessment of the route for construction traffic to and from the site and prompt action when issues are identified.
- Working hours of 08h00-19h00 Monday – Friday and 09h00-13h00 Saturday or as otherwise will be agreed with Fingal County Council.

Site Control Measures

The designated and operational on-site control measures, which will be established and maintained at this site, will include:

- Designated hard routes and appropriate signage will be provided throughout the site to ensure the safety of all road users and construction workers.
- Each departing vehicle to be checked by banksman.
- All heavy vehicles spilling solid material on the road must cover the material to prevent dust being thrown onto the road.
- All vehicles should wash their wheels, as necessary, at egress point.
- Hoarding will be set up around the perimeter to prevent pedestrian access.
- A material storage zone will also be provided in the Construction Compound area. This storage zone will include material recycling areas and facilities.
- Facility to clean local roads if mud or spillage occurs.
- The contractor will be obliged to ensure that any sub-contractors engaged on the site are made fully aware of the required mitigation measures and that they are properly implemented as part of any works that they undertake.

Control of Noise

Site deliveries will be confined to working hours and an allocated offloading location will be utilized for all deliveries. Measures for the control and monitoring of noise and vibration during construction, including measures to mitigate noise are indicated below:

- Ensure all vehicle movement (on site) occur within normal working hours. (Other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
- Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
- Plan the site layout to ensure that reversing is kept to a minimum.
- Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banksmen.
- Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.
- Wheel washing of vehicles prior to exiting the site shall take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

4.6.2 Operational Phase

The Dublin Transportation Office in its Advice Note on Mobility Management Plans/Travel Plans (July 2002) describes Mobility Management/Travel Plan as "a transport demand management mechanism that seeks to provide for the transportation needs of people and goods. The aim is to reduce demand for and use of cars by increasing the attractiveness and practicality of other modes of transport".

A Travel Plan will be implemented and developed on an ongoing basis with the triple objectives of promoting sustainability, enhancing public transport and reducing dependency on the use of the private car. It is important to strike an appropriate balance between promoting new development and preventing excessive car parking provision that can undermine cycling, walking and public transport use.

The Travel Plan / Mobility Management Plan is intended to deal with the typical day-to-day operating conditions at the site.

The Developer will be obliged to appoint a member of the site staff, who supports the philosophy of the Plan, as a Transport Co-ordinator. The Co-ordinator's roles in the development, implementation and management of the Plan shall include:

- Promotion of the Travel Plan to site workers;
- Implementation and maintenance of the Plan;
- Monitoring progress of the Plan;
- Production of information reports for the Developer and the Planning and Highway Authorities; and
- Ongoing assessment of the objectives of the Plan.

Within the first 4 months of being appointed, the Co-ordinator shall arrange for a worker's travel survey to be carried out. This can be achieved by means of self-completion questionnaires, which will help to identify travel requirements and set targets and needs.

The information requested in the questionnaire should include:

- Personal details;
- Primary mode of transport;

- Current travel patterns including the time taken to travel to work and the place of work;
- Views on alternative modes to the car (i.e. what would encourage them to switch to other modes);
- Usage of car sharing scheme by workers;

The monitoring and review of the Plan will be the responsibility of the Co-ordinator. The travel survey will establish the initial modal split of travel by staff.

The Co-ordinator, in consultation with the Developer and the Local Authority or its agents, will agree annual targets, following completion and analysis of the travel survey, for increasing the percentage of non-car modes or car sharing usage.

The Co-ordinator will:

- Meet with officers of the Local Authorities or its agents within a period of 6 months following occupation of the building(s) and thereafter every 12 months to assess and review progress of the Plan and agree objectives for the next 12 months, and
- Prepare and submit to senior management of the Developer, the Occupier(s) and the Local Authorities or its agents, an annual Monitoring Report.

Monitoring the success of the Travel Plan is essential for a number of reasons, including:

- Review the success of initiatives and whether they are meeting the objectives defined;
- Increase or reduce resource allocations as required;
- Forecast future activity; and
- Report on success.

As part of the monitoring process, the Coordinator will be responsible (in conjunction with other key personnel) to monitor and measure the below indicators:

- Changes in modal split;
- Number of staff traveling on a car sharing basis;
- Cars parked on site and utilisation of car parking provided;
- Number of staff using bus and sustainable modes of transport to commute to/from work;
- Facilities upgrades.

4.6.2.1 Action Plan

4.6.2.1.1 Walking

It is known that there are many local, global, and personal benefits to walking to/from work every day.

As part of the planned external road realignment on Kilshane Road (as per the Phase 1 planning application under Reg Ref. ABP-317480-23), footpaths will be provided on both sides of the road separated by a 2m wide grass verge. The internal layout of the Phase 1 development provides 2m wide pedestrian pathways on both sides of the roads, separated from the road by a 2m wide grass verge. All footpaths for the Proposed Development will be provided in accordance with Section 4.3.1 of the DMURS which suggests that a minimum 1.8m footpath should be provided.

4.6.2.1.2 Cycling

Cycling is a great way to travel short distances. It helps to promote independence and helps the environment. This way of transport would be a great option for commuters traveling from nearby locations to the Proposed Development.

For those workers wishing to commute to work by this mode, there will be dedicated cycle lanes along the realigned Kilshane Road (as per the Phase 1 planning application under Reg Ref. ABP-317480-23) within the site and cycling parking, showers and lockers will be provided if the demand exists. In addition, information about the government's bike to work scheme will be provided to all staff.

4.6.2.1.3 Public Transport

There are many benefits to taking public transport every day to/from work, such as helping the environment by reducing carbon emission, reducing congestion, saving money, and allowing you to relax and read.

For those workers who need to use public transport to commute to the Proposed Development, some initiatives will be used to encourage them such as, information about tax incentives for public transport users, provision of up-to-date public transport timetables and routes and advising of new staff about local bus routes and the nearest bus stops, and the travel time to/from Dublin City Centre and other key locations

4.6.2.1.4 Car sharing

There are many benefits of car sharing to/from work every day, such as reducing carbon emissions, reducing fuel costs, and parking fees, reducing congestions and journey times due to fewer cars being on the road and increasing the pleasure of the journey due to less congestion and having company. In this regard, a car sharing scheme will be strongly incentivised to encourage the staff to commute together and to minimise the number of staff traveling to and from work alone.

4.7 Monitoring or Reinstatement Measures

4.7.1 Construction Phase

As part of the Construction Management Plan, traffic management and deliveries will be subject to close monitoring during the construction stage. The contractor's mobility management plan will be subject to oversight on the part of the appointed contractor, with a view to ensuring the plan is operating effectively.

The responsibility for monitoring and reviewing the Plan will be borne by the main contractor. The principal indicators that will be subject to monitoring are as follows (but not limited to):

- Status of complaints received about the passage of Heavy Goods Vehicles.
- Level of compliance with management plans by the main contractor and subcontractors working on site.
- Changes in modal split – both 'usual' and 'occasional' modes used.
- Cycle Parking on site: Include the state of the bike racks and that there are no abandoned bikes without owners.
- Others that may be important.

It is recommended that within three months of the start of construction, and then every six months thereafter, the main contractor meets with Fingal County Council, to assess and review the progress of the management plans and to agree targets for the next six months.

4.7.2 Operational Phase

The responsibility for monitoring and reviewing the Plan will be borne by the Mobility Management Plan Coordinator. The principal indicators that will be subject to monitoring are as follows:

- Changes in modal split – both 'usual' and 'occasional' modes used.
- Cycle Parking on site: Include the state of the bike racks and that there are no abandoned bikes without owners.
- Bikes purchase through the Cycle to Work scheme.
- Number of car parking permits issued.
- Number of registered carsharers.
- Others that may be important.

An initial travel survey should be carried out by the Mobility Management Plan Coordinator. Once the travel survey has been completed and analysed, the Mobility Management Plan Coordinator will agree annual targets with the main stakeholders (the developer, the occupier(s), the Local Authority, or its agents, etc.) for increasing the percentage of non-car modes of transport.

It is recommended that the Mobility Management Plan Coordinator meet with the stakeholders, officers of the Local Authorities or its agents within six months of operation and thereafter every twelve months to assess and review progress of the Plan and agree objectives for the next twelve months.

As a consequence of the evaluation, the following potential outcomes may emerge:

- The objectives have been achieved, and no further intervention is deemed necessary to ensure alignment with existing local development plans.
- The objectives have not been fully achieved, necessitating the implementation of corrective measures that, due to their scale, can be managed by the Transport Coordinator.
- Large measures: the results are found to be significantly divergent from the stated objectives, which will necessitate the engagement of external consultants to develop the requisite mobility studies and implement the measures deemed necessary to realign the development with the originally stated objectives.

It is recommended that the Mobility Management Plan Coordinator prepare and submit to senior management of the Developer, the occupier(s) and the Local Authorities or its agents an annual Monitoring Report.

4.8 Residual Effects of the Proposed Development

4.8.1 Construction Phase

Based on their experience with projects of similar scale and location and considering the reduced number of car parking spaces outlined in the Mitigation Measures, the developer will provide a limited car park at the start of construction works by laying a temporary surface for vehicles.

As a result, an increase in surrounding traffic is anticipated, particularly during the PM peak hour. It is probable that the staff will arrive on site before 8am (prior to the morning peak of 8-9am) and leave during the evening peak of 5-6pm. However, it should be noted that the anticipated increase in traffic is expected to occur over a short-term period.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, which will be an obligation for the Contractor as part of the Construction Traffic Management Plan, and which will be approved by Fingal County Council.

On this basis, during the construction phase, traffic impact will likely have a temporary impact on pedestrians and cyclists. Due to the proposed mitigation measures, the effect of the Proposed Development will be temporary and minimised during the construction phase due to the Construction Traffic Management Plan.

4.8.2 Operational Phase

During the operational phase, a Mobility Management Plan (Travel Plan) will be implemented to promote sustainable travel behavior among staff and reduce reliance on private car use. The plan will be managed by an appointed Transport Coordinator responsible for promoting sustainable modes of transport, monitoring progress, and reporting to both the developer and the Local Authority. Travel Survey will be undertaken to assess modal split and identify opportunities to further increase public transport use, cycling, walking, and car sharing.

With these measures in place, residual operational traffic impacts on the surrounding road network are expected to be minimal. During the operational phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour. The two-way traffic increase will create a long-term impact, however, is a ***not-significant*** alterations to the junctions. Therefore, it is expected that this new traffic will represent a ***neutral*** impact.

4.9 Cumulative Impacts of the Proposed Development

An analysis of the traffic impact of the Proposed Development was carried out as outlined in Section 4.5.4 above. The TII document *Traffic and Transport Assessment Guidelines* (2014) states that impacts are considered significant where traffic generated by a development exceeds 10% on normal networks or 5% on congested networks.

Comparison of the base year two-way traffic flows (Section 4.3.1.4), construction traffic flows (Section 4.5.4.1) and operational traffic flows (Section 4.5.4.2) showed that Junction 1 and Junction 2 are expected to experience a two-way traffic increase below 5% in both AM and PM peak hours, indicating neutral and not-significant impacts. Accordingly, no further traffic assessment was required for either the construction or operational phases.

Potential future and committed developments in the surrounding area were also identified, and their trip generation established (Section 4.5.3). However, as the initial comparison already demonstrated increases below the 5% significance threshold, additional detailed assessment or traffic modelling incorporating growth factors and these cumulative trips was not required.

4.10 Interactions and Interrelationships

The interactions between this chapter and the other chapters of the EIAR are set out below.

4.10.1.1 Population and Human Health

During the construction phase, traffic impact will likely have a temporary impact on pedestrians and cyclists. Due to the proposed mitigation measures outlined in Section 4.8.1 above, the effect of the Proposed Development will be temporary and minimised during the construction phase due to the Construction Traffic Management Plan.

During the operational phase, Junction 1 and Junction 2 are expected to receive a two-way traffic increase below 5% in both the AM and PM peak hour. The two-way traffic increase will create a long-term impact, however, is a not-significant alterations to the junctions. Therefore, it is expected that this new traffic will represent a neutral impact on human health.

4.10.1.2 Biodiversity

Species using habitats in close proximity to the development sites will experience a temporary to short-term increase in disturbance as a result of human activity, noise and vibrations generated during construction activities. Such risks will be mitigated in accordance with this EIAR.

4.10.1.3 Lands and Soil

Material excavated during the Construction Phase will be transported by road for disposal at authorised and approved locations, as detailed in this EIAR. The movement of construction traffic will be managed in accordance with the Construction Traffic Management Plan to minimise disruption and environmental effects.

4.10.1.4 Air Quality

The generation of traffic during the Construction Phase has the potential to affect local air quality. However, these effects are expected to be of short-term duration and will be carefully controlled and monitored in accordance with the measures outlined in this EIAR. Dust suppression techniques, vehicle emission controls, and regular air quality monitoring will be implemented to minimise any adverse effects.

During the Operational Phase, the development is expected to result in a minimal increase in traffic volumes, which will contribute to an imperceptible, negative, long-term effect on air quality. Nonetheless, this effect is anticipated to be not significant, given the scale of the development and the mitigation measures proposed. These include the promotion of sustainable transport modes, such as walking, cycling, and public transport, as detailed in the Mobility Management Plan. The operational phase will also be subject to ongoing monitoring to ensure compliance with national air quality standards and climate objectives.

4.10.1.5 Noise and Vibration

The traffic generated during the Construction Phase has the potential to influence noise and vibration levels in the surrounding area. These effects are expected to be of short-term duration and will be carefully controlled and monitored in accordance with the mitigation measures outlined in this EIAR. Measures such as restricted working hours, use of low-noise machinery, and vibration monitoring will be implemented to minimise disturbance to nearby residents and sensitive receptors.

During the Operational Phase, traffic associated with the development will result in an imperceptible, negative, long-term increase in ambient noise levels. However, this is expected to be not significant, given the projected traffic volumes and the nature of the surrounding environment. Noise levels will remain within acceptable thresholds, and the Mobility Management Plan will support strategies to reduce reliance on private vehicles, thereby helping to limit any potential increase in noise and vibration over time.

4.10.1.6 Material Assets – Waste

Excess material excavated during construction works will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan

4.11 References

- Cycle Design Manual
  https://www.nationaltransport.ie/wp-content/uploads/2023/08/Cycle-Design-Manual_Sept.-2023_Low-Res.pdf
- Eastern and Midland Regional Spatial and Economic Strategy 2019-2031
  https://emra.ie/dubh/wp-content/uploads/2020/05/EMRA_RSES_1.4.5web.pdf
- BusConnects Routes Map

https://busconnects.ie/wp-content/uploads/2021/01/swords-area-map.pdf
- Greater Dublin Area Transport Strategy (2022 – 2042) Standards
  https://www.nationaltransport.ie/wp-content/uploads/2023/01/Greater-Dublin-Area-Transport-Strategy-2022-42-1.pdf
- Greater Dublin Area – Cycle Network Plan
  https://www.nationaltransport.ie/wp-content/uploads/2023/01/2022-GDA-Cycle-Network.pdf
- Implementation Roadmap for the National Planning Framework
  https://npf-cdn-prod.s3.eu-west-1.amazonaws.com/wp-content/uploads/20240502101327/NPF-Implementation-Roadmap.pdf
- Fingal Development Plan 2023 – 2029
  https://www.fingal.ie/development-plan-2023-2029
- New Dublin Area Bus Network – Bus Connects
  https://busconnects.ie/wp-content/uploads/2021/01/busconnects-final-summary-report-fa.pdf
- National Planning Framework – Project Ireland 2040
  www.gov.ie/pdf/?file=https://assets.gov.ie/246231/39baaa8c-48dc-4f24-83bd-84bbcf8ff328.pdf#page=null
- Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections. PE-PAG-02017
  https://www.tiipublications.ie/library/PE-PAG-02017-03.pdf
- Smarter Travel: A Sustainable Transport Future
  www.gov.ie/pdf/?file=https://assets.gov.ie/19854/37d829c9748446349ff586045bfbcaba.pdf#page=null
- Spatial Planning and National Roads: Guidelines for Planning Authorities
  https://www.gov.ie/pdf/?file=https://assets.gov.ie/111220/ef2d43a4-d3a0-418a-b0ba-03340e6d083a.pdf#page=null
- National Planning Framework – Project Ireland 2040
  www.gov.ie/pdf/?file=https://assets.gov.ie/246231/39baaa8c-48dc-4f24-83bd-84bbcf8ff328.pdf#page=null
- Huntstown Battery Energy Storage System – Construction Traffic Management Plan
  https://planningapi.agileapplications.ie/api/application/document/FG/7A74VKMLU4DD897XZKJW67EZKRKWQKFYUVHU9FD6E9PG8XUTV8LACGTPH7TLR3YDS2YL6YKAY4YAA
- Shipping Container Depot at Kilshane – Engineering Assessment Report
  https://planningapi.agileapplications.ie/api/application/document/FG/TB5RFCAQW4X4HFKZSCGK5EZA55U4S8WNDQNEQEZEAYP8BUE3E5V4J642C7N6SQTFMLF3KT3A9HVQF
- High Technology Manufacturing Unit – Chapter 12 Environmental Impact Assessment Report
  https://planningapi.agileapplications.ie/api/application/document/FG/YGQMBLNVUFM85WPD9NA8A28J5JXWTWEBW87TGUHSYFELUYR5X8CSVYNVMWGK96LME4JKQHUBVPAZV
- Huntstown Data Hall – Chapter 13 Environmental Impact Assessment Report
  https://planningapi.agileapplications.ie/api/application/document/FG/48Q39TFYT98DJHZLL76E5Y7Y62ANHR7K85KB2R8AL5CCUSK9YPVCQYWAJ7R6F5J63789WDWE7C2ZW
- Gas Turbine Power Generation Station (Phase 1) – Traffic and Transport Assessment Report
  https://www.pleanala.ie/publicaccess/EIAR-NIS/311528/EIAR%EF%80%A8/Volume%202/EIA%20Volume%202-EIA%20Report-Complete.pdf?r=896718
- Overall Site Masterplan – Chapter 13 Environmental Impact Assessment Report
  https://www.pleanala.ie/publicaccess/EIAR-NIS/317480/317480%20-%20eiar%20main%20report%20(january%202023)%20(part%209).pdf?r=212977

Chapter 14 – Material Assets (Utilities)

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14. MATERIAL ASSETS (UTILITIES)

14.1 Introduction

This EIA Chapter has been prepared to assess the likely significant effects on Material Assets (Utilities) in respect of the proposed Phase 2 of the permitted Kilshane Gas Turbine Power Plant.

Material assets are resources that are valued and intrinsic to the site of the Proposed Development and surrounding environs. Material assets may be of either natural or human origin, though is usually taken to refer to built services and infrastructure, and the value may arise for economic or cultural reasons.

This Chapter considers and assesses the effects of the Proposed Development on the material assets, including major utilities within and around the site during the construction and operational phases such as built services (i.e. gas, electricity, telecommunications, etc.). Although Water and Traffic are also considered material assets, these are assessed under separate chapters of this EIAR (Chapter 6: Hydrogeology and Hydrology and Chapter 13 – Traffic and Transportation), respectively).

A full description of the development can be found in Chapter 2: Description of Proposed Development of this EIAR.

14.2 Methodology

This chapter has been prepared in accordance with the requirements of the following statutory documents which were consulted in the course of the study: -

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

EPA, Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (September 2003). Note that an updated advice note, on foot of the May 2022 guidelines, is anticipated soon but has not yet been published.

EPA, Advice notes for preparing Environmental Impact Statements (September 2015).

Circular Letter Pl 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive).

The study was also informed by numerous site visits, topographical surveying of the application site, the sourcing of utility information/records from the relevant service providers, an analysis of the resources consumed, and an estimation of waste generated by the Proposed Development at both the construction and operational phases.

Material assets are generally considered to be location sensitive. The likely significance of all impacts is determined in consideration of the magnitude of the impact and the baseline rating upon which the impact has an effect (i.e., the sensitivity or value of the material asset). Having assessed the magnitude of impact with respect to the sensitivity / value of the asset, the overall significance of the impact is then classified as imperceptible, slight, moderate, significant, or profound. The criteria for the assessment of impact significance are as per that set out in the relevant EPA Guidelines and in accordance with the EIA Directive.

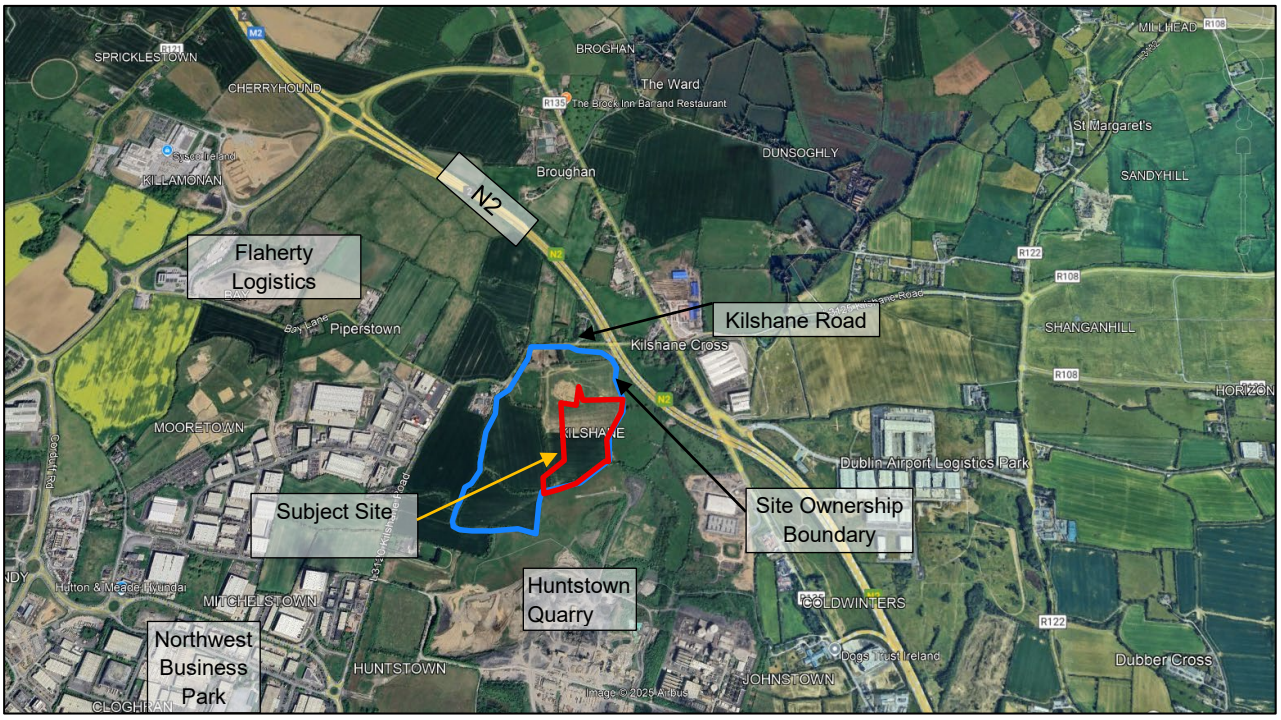
14.2.1 Forecasting Methods and Difficulties Encountered

There were no difficulties encountered when undertaking this assessment.

14.3 Receiving Environment

The site is located at Kilshane, Dublin 11, just west of the N2 Primary Road as shown in Figure 14-1, approximately 300m west of the R135 and is located approx. 2 km north-west of the M50. The site is under ownership of the applicant and mainly comprises of agricultural fields (mostly tillage). It totals c. 5.22 ha in area, as indicated in Figure 14-1 below.

Figure 14-1. Site Location (Source: Google Earth)



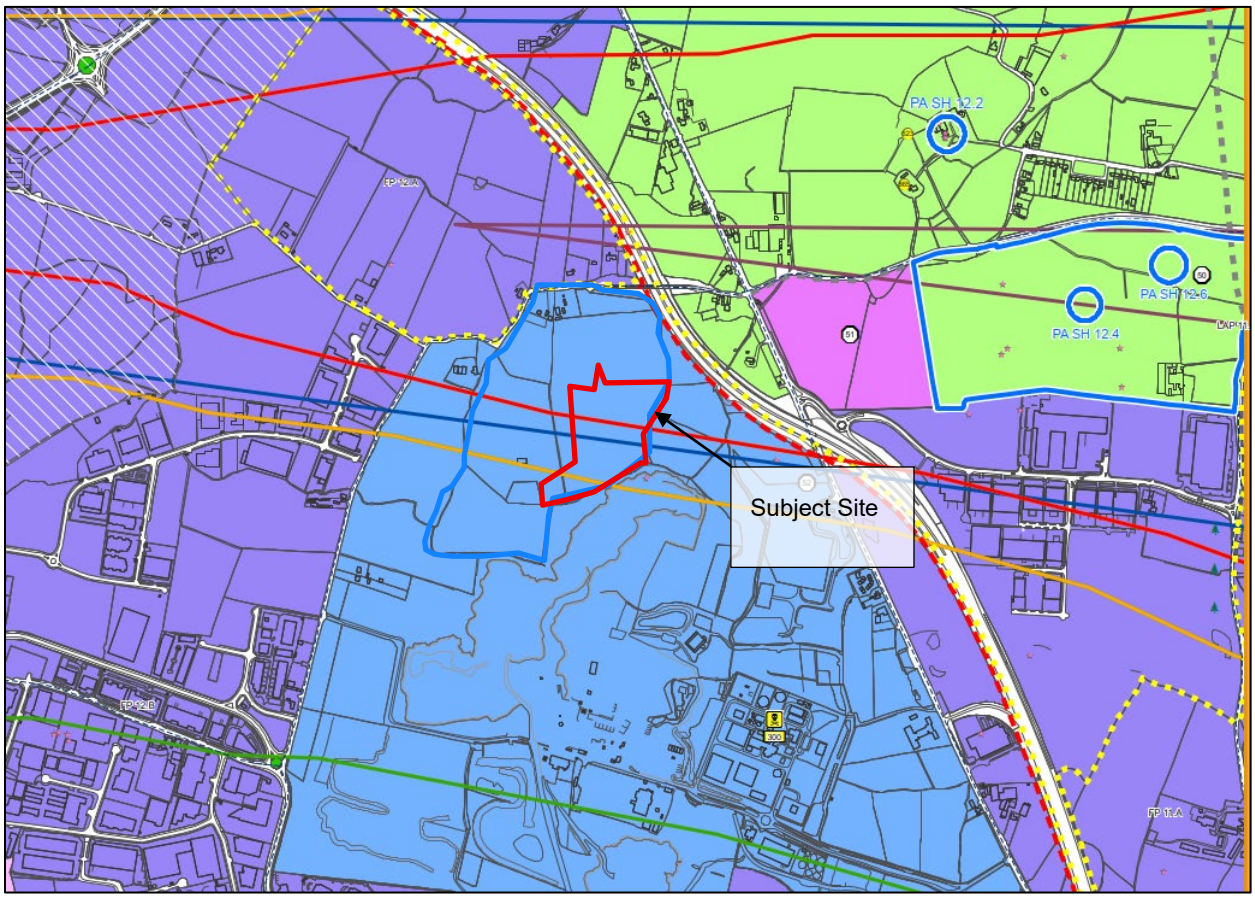
The subject lands are bound to the north and northwest by the Kilshane Road, to the west and southwest by an industrial site (Flaherty Logistics), and agricultural lands, to the south and southeast by Huntstown Quarry, and again to the east by agricultural lands.

A topographic survey of the area indicated that the site generally slopes from west to east with a high point of 80.50m OD Malin on the western boundary, and a low of 77.54m OD Malin on the eastern boundary.

The topographic survey and OS details also indicate that the boundary hedgerows separating the fields comprising the site contain local ditches which convey surface water flows from rainfall in a north-easterly direction. These ditches serve only the subject site and the adjacent agricultural lands to the west, between the site boundary and the Kilshane Road.

The Fingal Development Plan 2023-2029 shows in its Map No. 12 (Blanchardstown North), that the site is located entirely within the blue area which denotes lands zoned: HI, for Heavy Industry, refer to Figure 14-2 , below.

Figure 14-2. Site Location (Source: Google Earth)



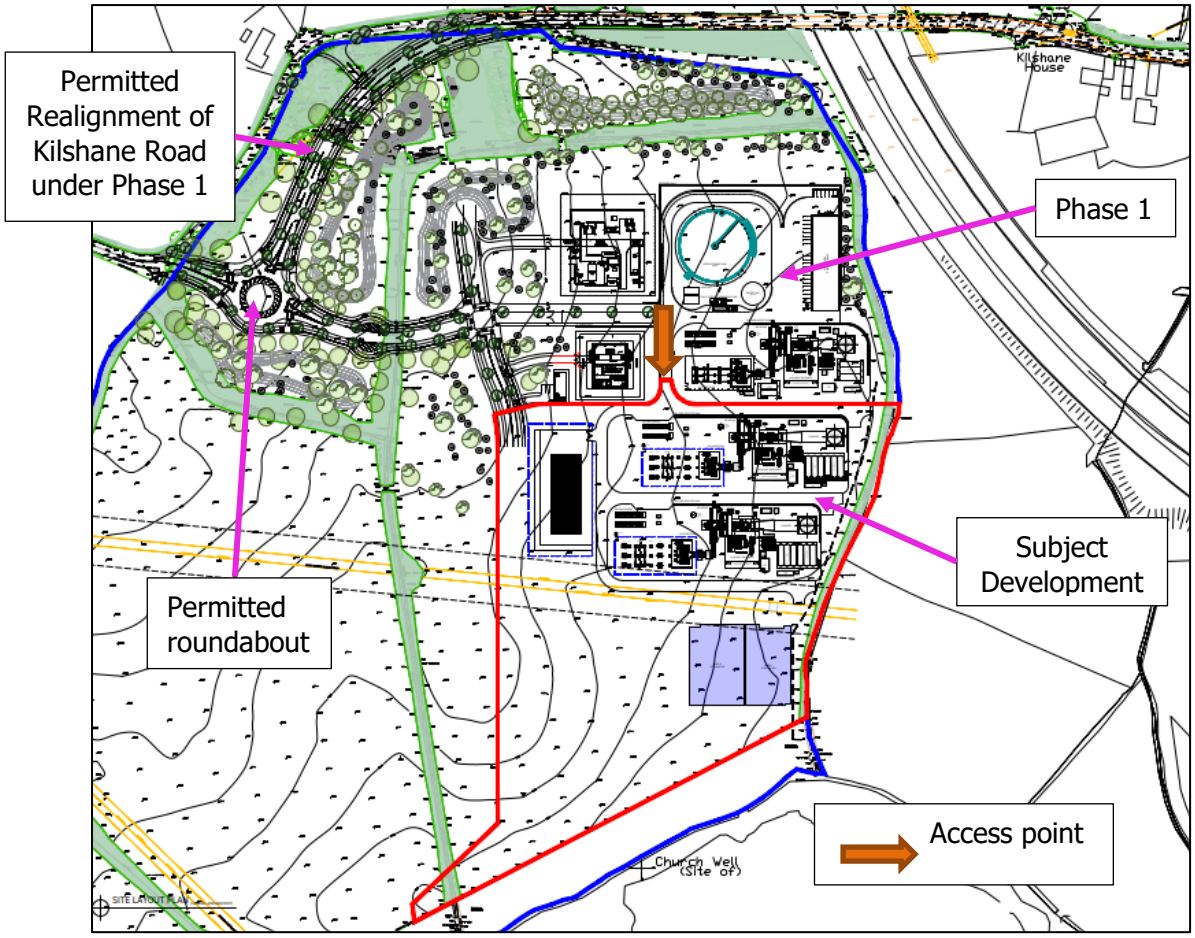
14.3.1 Access

Vehicular access to the subject development is proposed via a new roundabout on Kilshane Road, which forms part of the Phase 1 development located immediately north of the subject site. This phase has received a notification to grant permission under Reg. Ref. ABP-317480-23. The permitted roundabout will also serve as the primary access point for pedestrians and cyclists.

As part of the permitted Phase 1 subject development, a section of Kilshane Road along the north-western boundary of the site is proposed to be realigned and upgraded. The upgraded road layout will include dedicated 2-metre-wide footpaths and 2-metre-wide cycle lanes on both sides of the carriageway.

The development access point is shown in Figure 14-3 below:

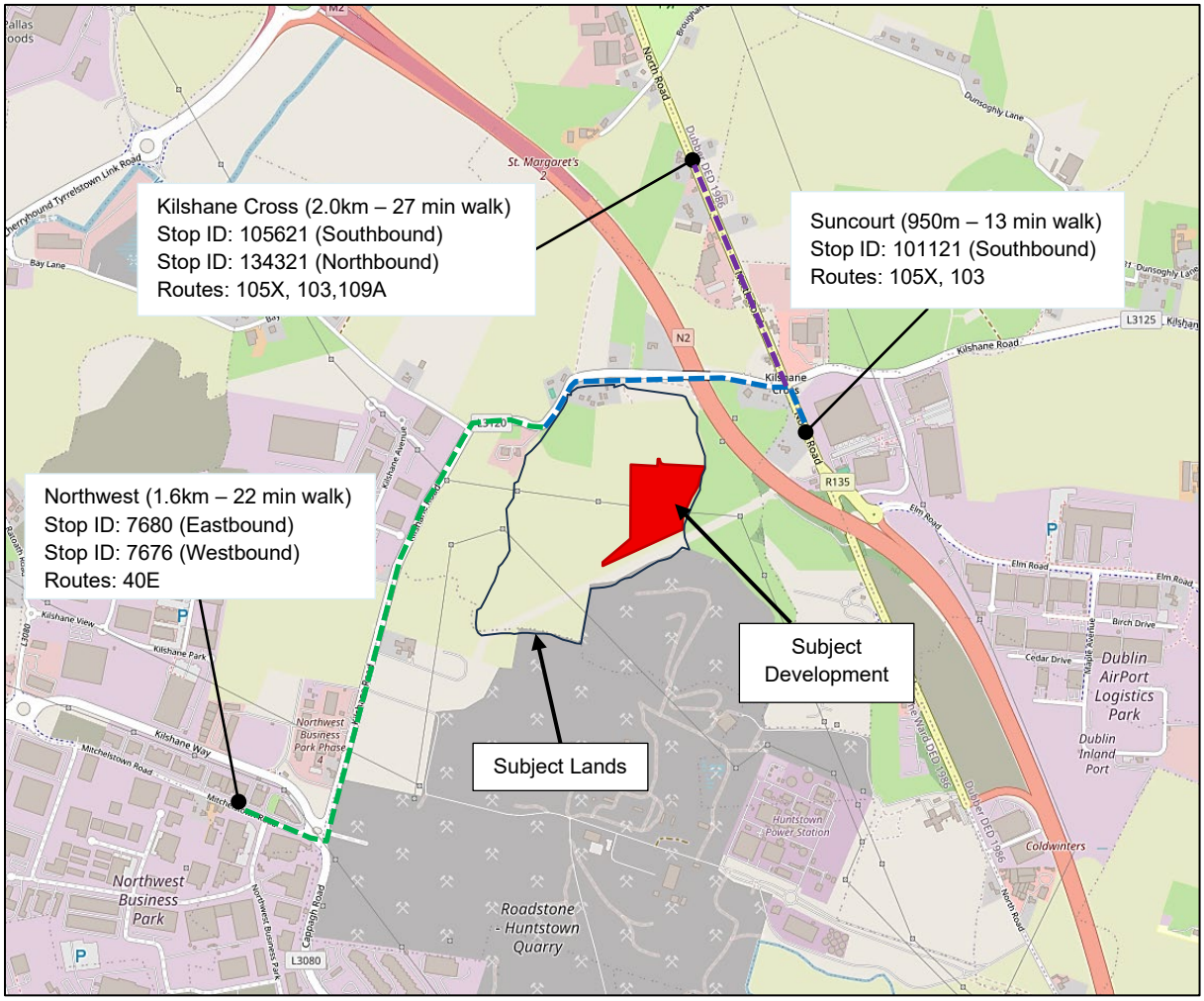
Figure 14-3. Proposed Development – Site Access Point



There are no public transport services operating directly on Kilshane Road. The nearest bus stops are located on the R135. Additionally, there are bus stops located on the Mitchelstown Road at the Northwest Business Park, situated to the east and southwest of the site. Details on current bus services and walking routes to/from the site are provided below:

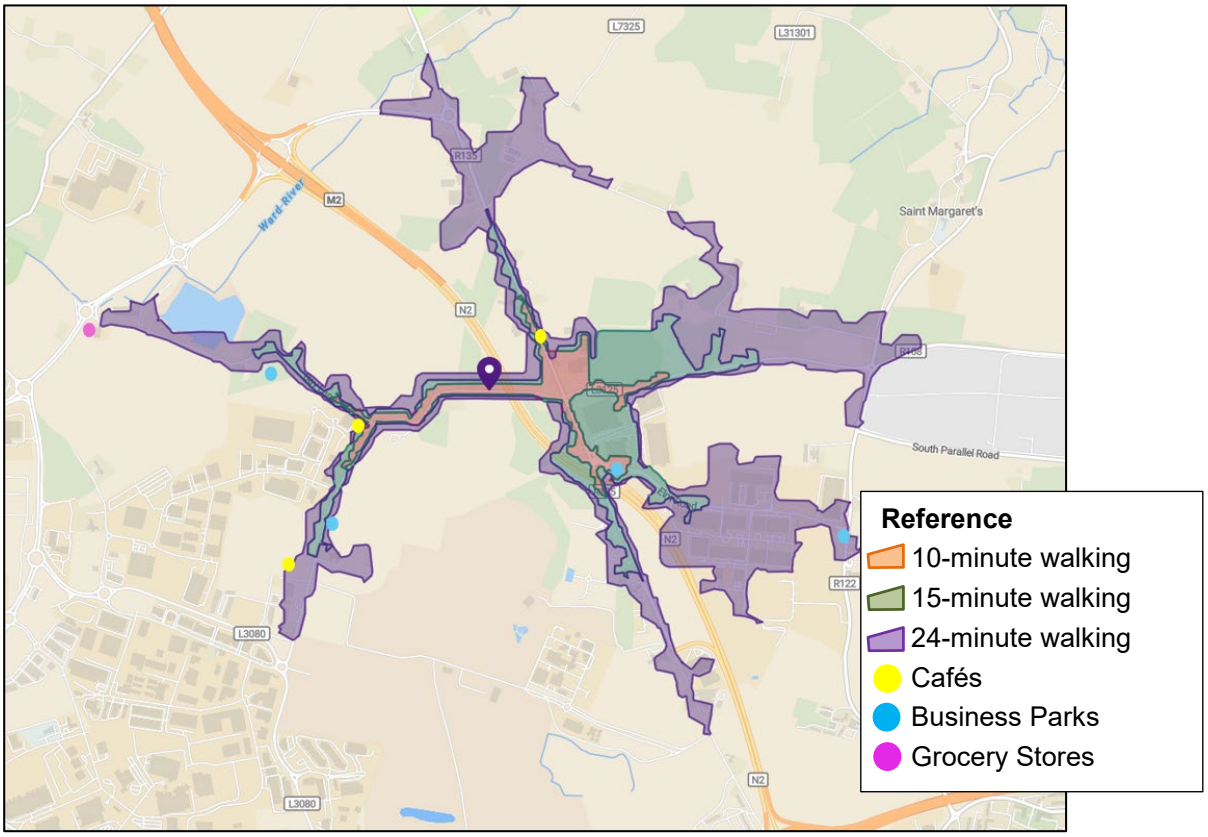
- "Suncourt" bus stop (Stop 101121) on the R135. This is 950m (approx. 13 min walk) away from the existing site entrance. This stop is served by bus routes 103 & 105X in a southbound direction only.
- "Kilshane Cross" bus stops numbers 105621 and 134321 on the R135. This is 2.0km (approx. 27 min walk) away from the existing site entrance. This stop is served by bus routes 103 & 105X in a northbound direction only.
- Northwest bus stops numbers 7680 and 7676 on the Mitchelstown Road at Northwest Business Park, serve route 40E in both directions and are 1.6km (approx. 22 min walk) away from the existing site entrance.

Figure 14-4. Bus Network – Walking distance from development to Bus Stops



Consequently, Figure 14-5 below details the 10-, 15- and 24-minute catchments areas, through the form of isochrones, to summarise the accessibility of the subject site on foot (Preferred Maximum) to Town Centres, Elsewhere and Commuting Schooling / Sight-seeing

Figure 14-5. Isochrone map indicating Walking Accessibility (Source: Smappen)

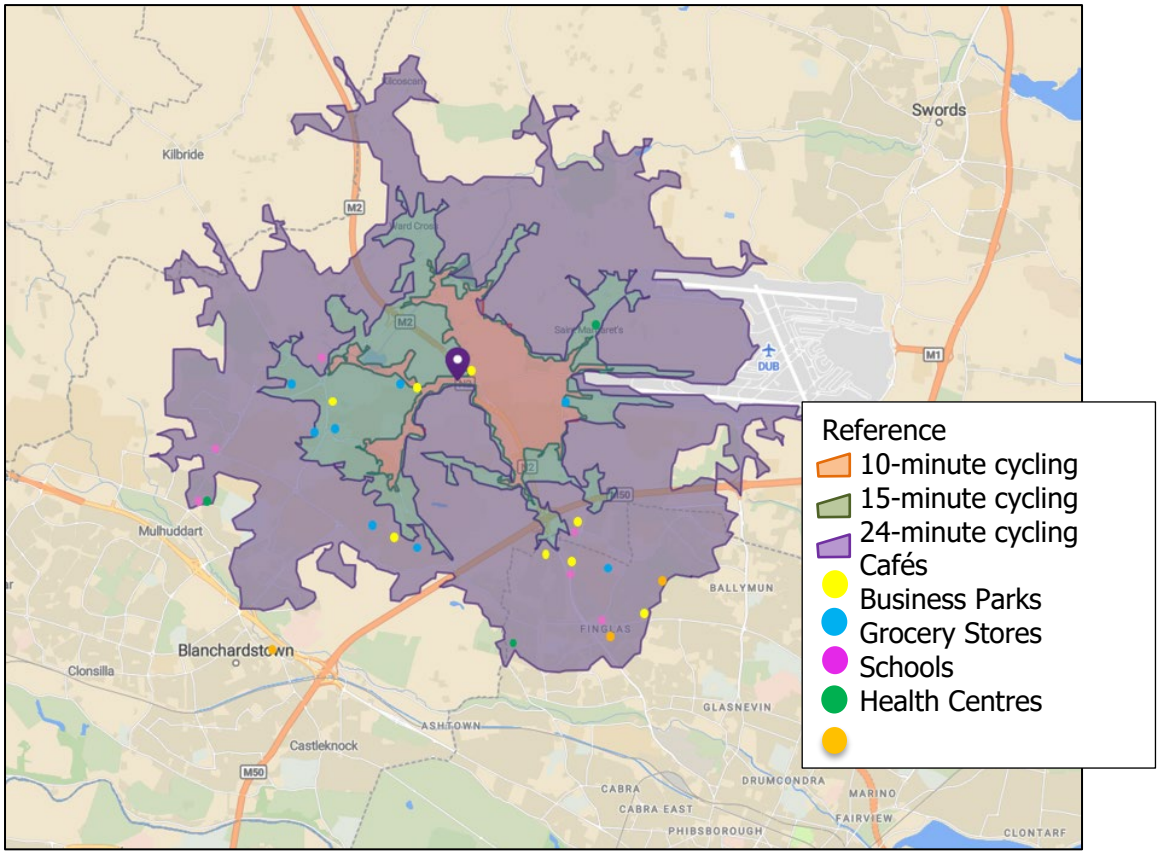


There are no dedicated pedestrian walkways along Kilshane Road in the vicinity of the subject development. However, there is a pedestrian footpath, on the northern side of the road closer to the N2 east over the N2 flyover for approximately 380m.

As illustrated, a 24-minute walk will enable access to bus stops and bus routes. It also provides access to amenities such as cafés, grocery stores and business parks.

There is no dedicated cycle infrastructure along Kilshane Road. The figure below illustrates the cycling catchment areas accessible from the subject development for 10, 15, and 24-minute cycle times.

Figure 14-6. Existing cycling infrastructure (Source: Open Street Map)



The figure above illustrates that the 24-minute cycle catchment area includes provides access to amenities such as cafés, grocery stores, medical centres and schools.

14.3.2 Water Supply

In terms of water supply, there is a 50.8 uPVC watermain is located to the north of the site on the Kilshane Road. The south of the site is traversed by a 914.4mm (36") concrete watermain. This distribution main is fenced off as a protective measure.

The Permitted Development (Phase 1) will connect to the 110mm Ø MOPVC watermain located to the southwest of the site on Kilshane Road to the 50.8 uPVC watermain adjacent to the site via a 150mm Ø watermain.

14.3.3 Foul Sewer

Considering the site's topography, the Permitted Phase 1 development and adjacent outline lands will be serviced by a privately managed pumping station in agreement with Irish Water. The Permitted Development includes a 150mm diameter rising main from the on-site pumping station, spanning approximately 1,818 meters to link with the existing gravity foul network on Mitchelstown Road. This pumping station will provide a 24-hour storage capacity for foul flow.

14.3.4 Surface Water

The Permitted Phase 1 development is subject to a Storm Water Management Plan that includes various SuDS techniques designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and the SuDS Manual.

The permitted drainage scheme includes permeable paving at parking areas, swales to cater to excess flows and underground attenuation systems. The storm water network has been designed with flow control manholes between the attenuation tank and the outfall headwall to limit discharges to the greenfield equivalent runoff. The permitted drainage also includes Class 1 bypass interceptors and full retention petrol interceptors before surface water outfalls to the existing ditch.

Ditches along the Kilshane site boundary will cater for most of the stormwater on site and will ultimately discharge to the Huntstown Stream, located to the south of the Kilshane site. In case of excess rainfall, storm water will be attenuated in the underground tanks for each catchment area within the site.

The Permitted Phase 1 Development is divided into 3 catchment areas. Catchments 1 and 2 are located to the north of the site, with a total underground storage capacity of 603m^3 and 542 m^3, respectively, while Catchment 3 is to the south of the site with a total underground storage capacity of 1,735 m^3.

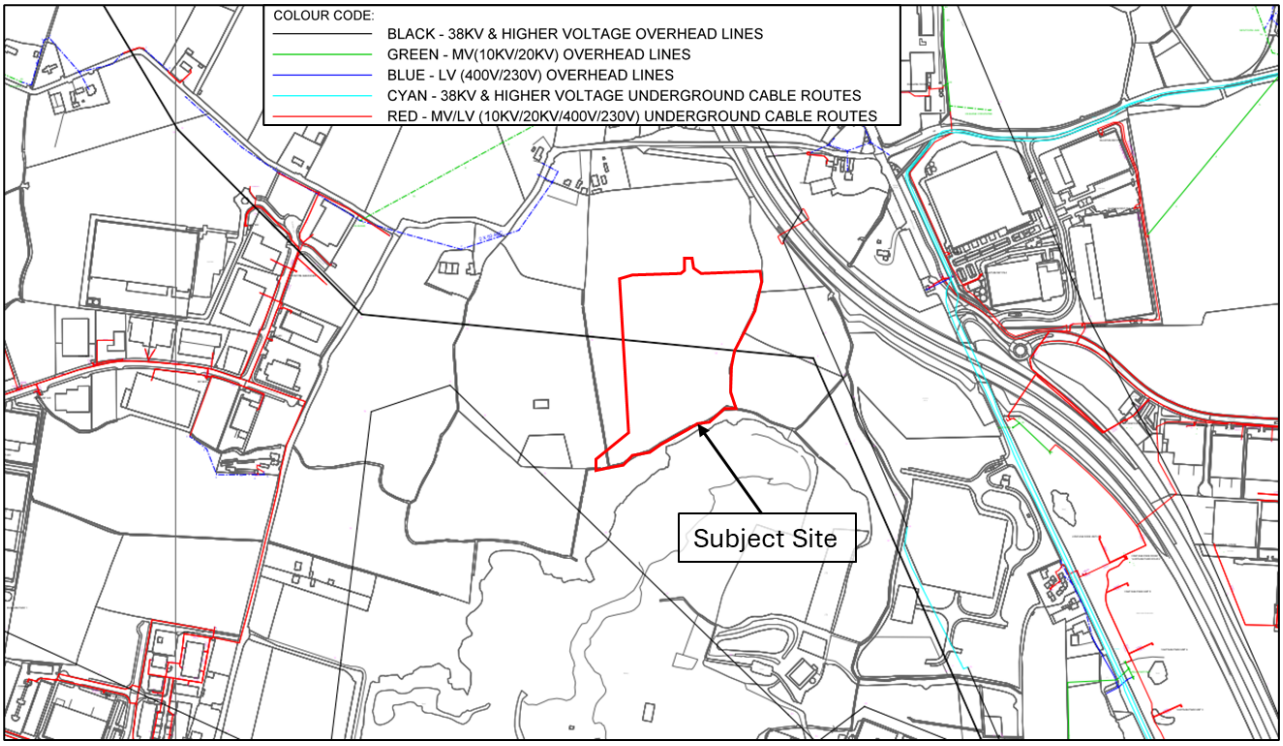
14.3.5 Electricity, Gas and Telecommunications

There are electricity, gas, and telecommunications utilities available to the site.

Based on the information received from ESB Networks (ESBN), there is a high voltage overhead ESB line that traverses the Subject Development as shown in Figure 14-7 overleaf. The 2 no. additional turbines proposed as part of the Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that the applicant will submit an application for a new gridline in due course.

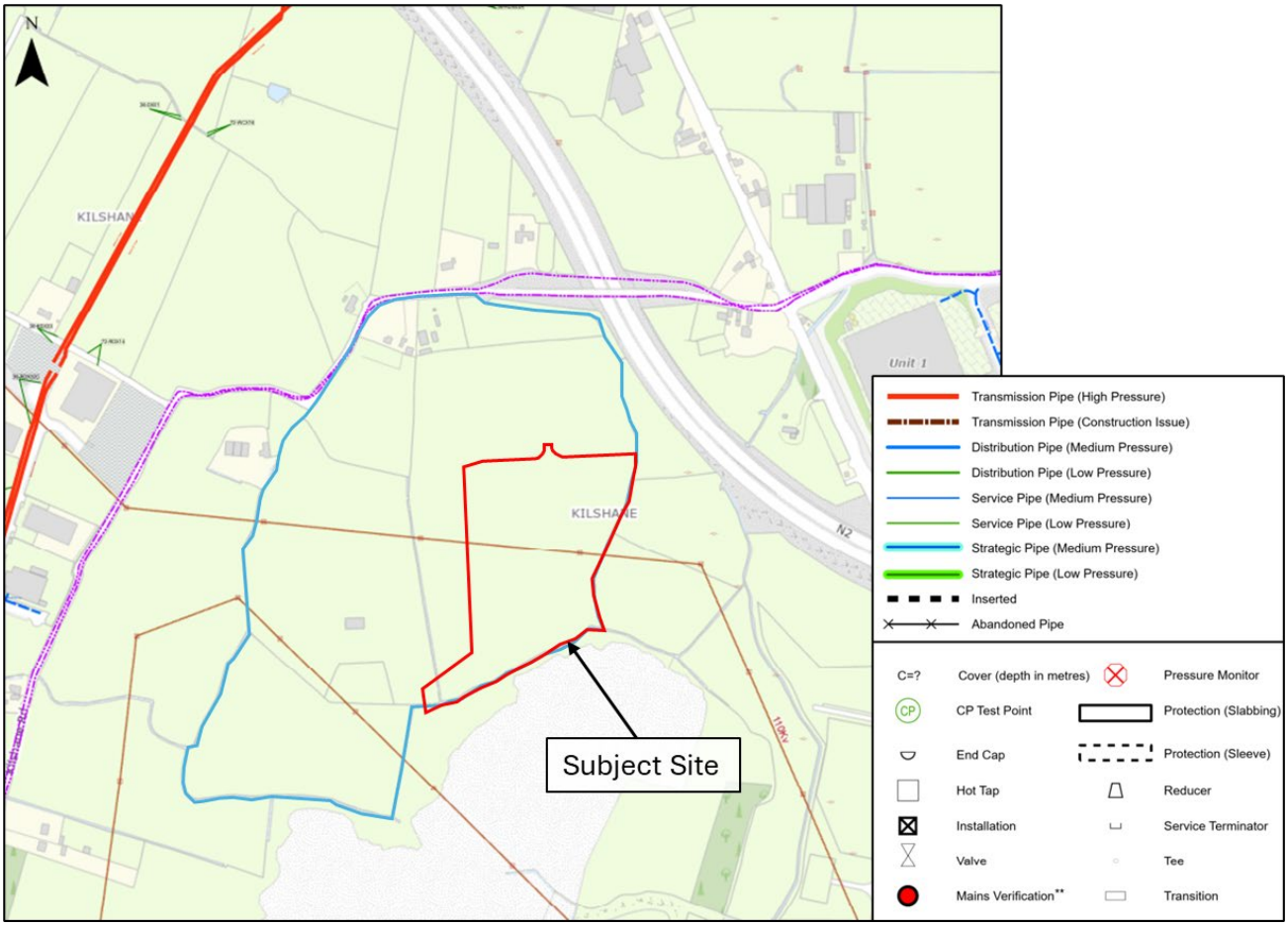
The permitted Phase 1 development to its immediate north comprises of the construction of a Gas Turbine Power Generation Station with an output of up to 293 Megawatts. The proposed station will consist of 1 no. Gas Turbine, 1 no. 28m high Exhaust Stack, 1 no. 2 story Admin Building (c. 680 m2), 1 no. single storey Workshop (c. 661 m2), 1 no. single storey Plant Room Building (c. 608 m2), 1 no. single storey Dew Point Heater Boiler Building (c. 52 m2), 1 no. single storey Electrical Module for Fuel Gas Area Building (c. 45 m2), 1 no. single storey Packaged Electronic Electrical Control Compartment building (PEECC) (c. 150 m2), 1 no. single storey E0Room Building (c. 227 m2), 1 no. single storey Fuel Gas Block Building (152 m2), 1 no. single storey Continuous Emission Monitoring System (CEMS) Building (c. 9 m2), 1 no. single storey Fuel Oil Treatment & Forwarding Building (c.59 m2), an Above Ground Installation (AG() area consisting of 1 no. single storey Instrument Building (c. 28.5 m2), 1 no. single storey Regulator Building (47 m2), 1 no. single store Boiler Building (c. 28 m2), and 1 no. single storey Analyser Kiosk (6 m2), 2 no . 20 m high diesel storage tanks and recessed bund area, 1 no. 17 m high Raw and Fire Fighting Water Tank, miscellaneous plant and equipment.

Figure 14-7. Existing ESB Network (Source: ESB)



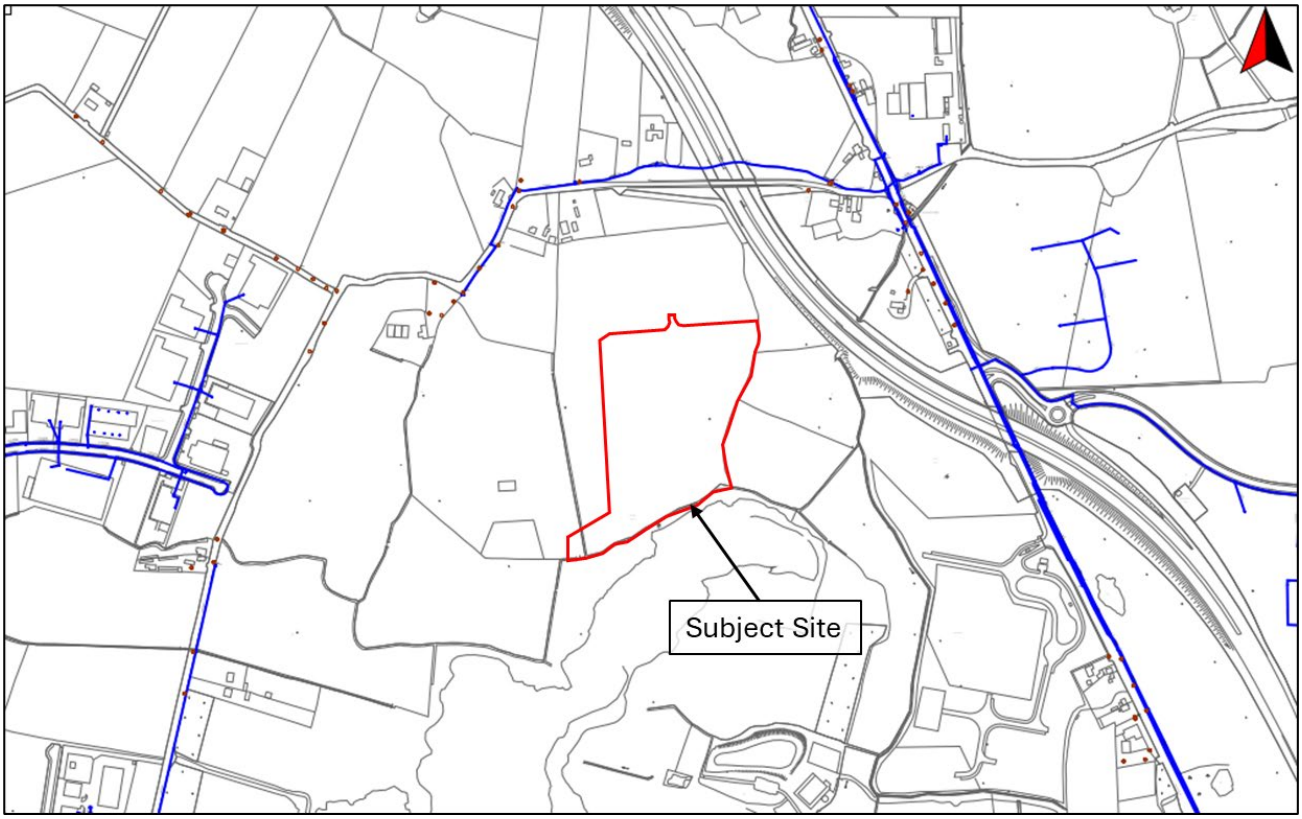
Based on the information received from Gas Networks Ireland, the nearest existing gas mains are located c. 330m to the east of the subject site at Quantam Distribution Park and c.520m to the west of the subject site along Kilshane Road as shown in Figure 14-8 below.

Figure 14-8. Existing Gas Networks Ireland Network



Eir currently has an existing network to the north and north-west of the subject site along Kilshane Road as shown in Figure 14-9 overleaf.

Figure 14-9. Existing Eir Telecommunications Network



14.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development . The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development .

The Proposed Development will consist of the following:

- 2 additional gas turbines producing 340MW each
- 400kV GIS compound and associated compound
- Increasing diesel storage from 5000t to 15000t
- Extension to administration building
- Access roads
- Electrical substation

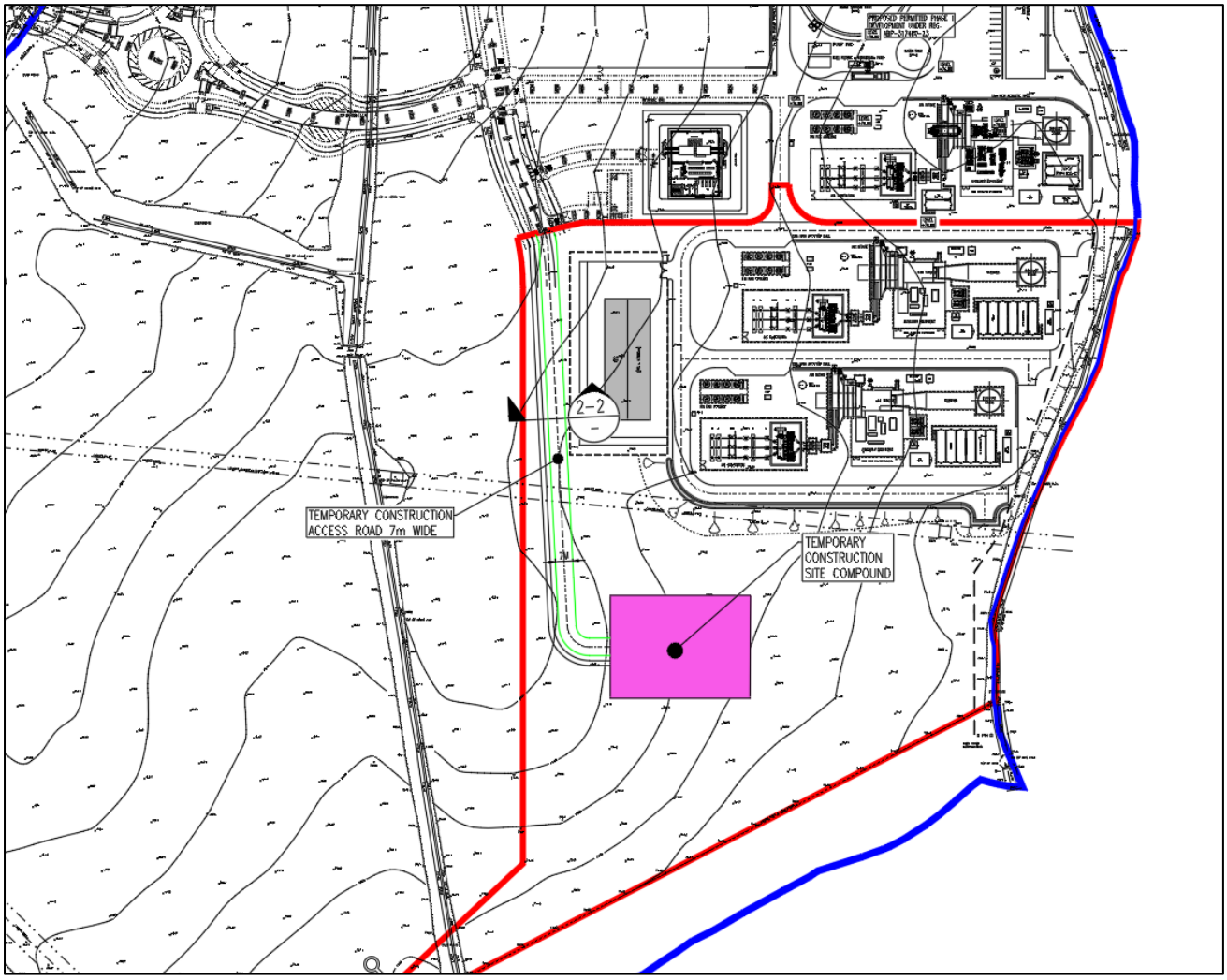
14.4.1 Construction Phase

In order to facilitate construction of temporary welfare facilities for construction staff, a 100mm temporary connection will be sought to accommodate this. Additionally, a temporary 25mm water connection will be provided to ensure water supply for construction staff.

A 7m wide temporary construction access road as per the figure below will be constructed to facilitate access to the temporary construction site compound and includes a 2m wide footpath.

During the construction stage the main source of air quality effects will be as a result of fugitive dust emissions from site activities. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site.

Figure 14-10. Temporary Construction Access Road



14.4.2 Operational Phase

The subject Phase 2 development is reliant on the permitted Phase 1 foul water network and pumping station under Reg. Ref. ABP-317480-23 and whose Confirmation of Feasibility was issued under CDS22004080. There will be an increase of 10 no. operational staff in the subject development whose foul water peak flow calculations have been undertaken in section 2.3 of the Engineering Assessment Report

by Waterman Moylan. An upgrade of the Phase 1 development welfare facilities is not required to accommodate this staff increase. As such, there are no proposed foul water requirements within the subject Phase 2 red-boundary line. A Confirmation of Feasibility (CoF) for the Subject Phase 2 development has been issued under CDS25004544, which notes that water and wastewater connection are feasible without infrastructure upgrade by Uisce Éireann.

Consequently, it is proposed to connect to the permitted phase 1 watermain network under Reg. Ref. ABP-317480-23 via a 200mm Ø watermain which will loop around the subject site. The water supply requirements under the permitted Phase 1 development took into account the water demand for the entire masterplan lands, which includes the subject phase 2 development. As such, there are no additional water supply requirements for the subject phase 2 development besides the increase in operational staff from phase 1 (10no. staff) which will be accommodated within the Phase 1 welfare facilities. Refer to watermain drawing no. 25-046-P300 for the proposed watermain layout.

The Proposed Development will be a continuation of the permitted fast start peaking Gas Turbine Power Plant and will provide two additional turbines for an increased energy production capacity with an output of 680 Megawatts (MW).

The power produced by the proposed and permitted turbines will be exported to the EirGrid transmission network up to the Maximum Export Capacity (MEC) as specified in the EirGrid Connection Agreement. It is proposed that while the Power plant is exporting power to the grid, it will simultaneously power the proposed and permitted infrastructure. When the Power Plant is offline, it will import power from the grid.

The Proposed Development will operate intermittently throughout the year, with the expected scenario: Assumes each unit operates for 100 hours per year and conservative/maximum hours scenario: Assumes continuous operation of all units (24/7/365). The operation of the proposed turbines will play a role in stabilizing electricity supply during periods of heightened demand or potential shortages. The energy produced by Proposed Development, along with the Permitted Development, will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity is not available.

The natural gas will be supplied by a gas yard owned and operated by Gas Networks Ireland, with no fuel compression required. The gas yard, known as an Above Ground Installation (AGI), and its connection to the nearby gas main, will be subject to separate consent from the Commissioner for the Regulation of Utilities (CRU). It will be developed, owned and operated by Gas Networks Ireland.

In line with the Permitted Development, the proposed turbines will be designed for dual fuel operation. While natural gas will be the primary fuel, fuel oil will be stored and used on site as an emergency backup fuel source in the event of an interruption to the gas supply.

The fuel oil will be delivered to the site via tanker trucks and will be manually pumped into the double-walled oil storage tanks.

When required, the oil will be pumped to the turbines. Air extracted from the gas turbine's compressor will be used to atomize the fuel oil prior to combustion.

The gas turbine operated by drawing air through an inlet filter house into a compressor, where the air is pressurized and heated. This compressed air is then mixed with fuel and ignited in the combustion chambers. The resulting hot, pressurized gases expand through the turbine, spinning the shaft and generating mechanical energy.

Exhaust gases will exit the turbine through ducting and a horizontal silencer, before being released via the proposed stacks.

The electricity generated from the turbines will be fed through separate generator step up transformers located in the onsite Air Insulated Substations (AIS) which will step up the voltage from 20kV to 400kV. It will then be delivered at 400kV to the Gas Insulated Substation (GIS), where it will be transmitted to the external grid network.

The Proposed Development will operate within EPA licensed emission limits ensuring no environmental exceedances are expected to occur as a result of the additional turbines.

The power requirements for the Proposed Development will be provided via the proposed 400kV Gas Insulated Switchgear (GIS) compound. This GIS station will be connected to the transmission network via an underground cable connection to a nearby 400kV substation. This connection will be subject to a separate SID under Section 182 of the Planning and Development Act. Additionally, 2no. Air Insulated Substation (AIS) are proposed, one for each new turbine. The AIS will have a step-up transformer that will increase the voltage of the electricity produced in the turbines to match the 400kV voltage of the GIS.

It is proposed that when the turbine units are in operation, they will supply the site's electrical demand using their own generated power. When the turbines are offline, the site's power requirement estimated at approximately 1.5MW per hour, will be met by the grid.

There are two scenarios for annual energy production, based on EirGrid requirements:

- Expected Scenario: Assumes each unit operates for 100 hours per year per turbine.
- Conservative/Maximum Hours Scenario: Assumes continuous operation of all units (24/7/365).

The total energy production and the energy exported to the grid are summarised in the Table below.

Table 4-1 Energy production for both scenarios

Scenario	Total for site (both turbines) - MWhe	
	Annual energy production	Annual Energy exported to the grid
Expected Scenario - 100 hours running per unit	68,000	66,785
Conservative/Maximum Hours Scenario - 24/7/365 running on both units	5,956,800	5,848,024

All electrical connections will be carried out in accordance with the requirements of the relevant service provider, working around the existing and permitted infrastructure at the Kilshane site.

The Proposed Development will be tied to the permitted on-site natural gas line. No new connection to the gas mains is required outside the site boundary. The estimated annual gas consumption for the Proposed Development is as follow:

- Expected Scenario total for site - 172,195MWht.
- Conservative/Maximum Hours Scenario (24/7/365 running on both units) - 15,084,325MWht.

Permitted telecommunication lines for telephone and broadcast services will be extended and serve the Proposed Development when operational. No new telecommunication service connection will be required.

14.5 Potential Impacts of the Proposed Development

The Construction phase will likely have a temporary impact on the sparse, stand-alone existing dwellings located in the vicinity of the subject lands. There may also be some slight and temporary impacts to the existing population which may arise during the construction phase. Refer to Chapter 8: Air Quality, Chapter 9: Climate and Chapter 10: Noise and Vibration for further information.

14.5.1 Construction Phase

14.5.1.1 Site Location and Context

During the construction phase, access will be affected by hoarding and security fencing required onto the public road network. A detailed traffic management plan will be prepared and implemented by the Main Contractor and agreed with the Local Authorities prior to commencing works. As a result, there will be a temporary disturbance to traffic in the surrounding area during construction.

The number of construction vehicle movements anticipated is low compared to the number of trips expected to be generated by the Proposed Development during the operational phase. It should be noted that the majority of such vehicle movements would be undertaken outside of the traditional peak hours, and it is not considered that this level of traffic will result in any operational problems.

Construction traffic will arrive from Kilshane Road, approaching through the permitted phase 1 development and the temporary construction access road. Flag men shall operate to ensure safe access and egress of HGV's. It is likely that construction will have a negligible impact on pedestrian and cycle infrastructure. It is proposed that a Construction Management Plan (CMP) be prepared by the appointed Main Contractor in order to minimise the potential impact of the construction phase of the Proposed Development on the safety and amenity of other users of the public road.

14.5.1.2 Water Supply

- There is a risk of contamination of the existing water supply during the construction of the development when the connection of the trunk watermain to the public water supply is being made.
- There is a risk of damage to watermain fittings due to high pressure in the existing watermain.
- There will be a minor water demand for the site office.
- The Proposed Development will not give rise to any significant long-term adverse impact. Negative impacts during the construction phase will be short-term only.

The construction of the Proposed Development has the potential to cause a ***slight***, ***adverse***, ***temporary***, and ***residual impact*** on the receiving water supply network.

14.5.1.3 Drainage

- There is a minor risk of ingress of ground water to the surface water network.

The construction of the Proposed Development has the potential to cause a ***slight***, ***adverse***, ***temporary***, and ***residual impact*** on the receiving foul network.

14.5.1.4 Electricity, Gas and Telecommunications

Electricity will be required during the construction phase. In conjunction with the ESB, the provision of a temporary builders' power supply will be provided. There is potential for temporary impacts to the local electricity supply network, by way of disruption in supply to the local area during electricity connection works for the Proposed Development. However, this is a potential impact which is likely to be ***neutral, slight,*** and ***temporary***.

Gas supply will not be required during the construction phase of the Proposed Development. Therefore, the impact is deemed to be ***neutral, imperceptible effect***.

Telecommunications will not be operational during the construction phase of the Proposed Development. There is potential for temporary impacts to local supply, by way of disruption during connections works. However, this is a potential impact which is likely to be ***neutral, slight,*** and ***temporary***.

14.5.2 Operational Phase

14.5.2.1 Drainage

Stagnation of the water and siltation within the pump set may occur. Silt would be collected at a sump and removed periodically.

There may be the possibility of surface water ingress into the storm water drainage system due to poor workmanship which would increase the load on the existing sewers and pumping station. This is a potential impact which is likely to be ***neutral***, ***slight***, and ***temporary***.

14.5.2.2 Water supply

The Proposed Development will result in an increase in water demand on the water distribution network. This increase in demand can be catered for in the existing network. However, this impact is deemed to be ***neutral, imperceptible,*** and ***long-term effect***.

14.5.2.3 Electricity, Gas and Telecommunications

The Proposed Development will result in a slight increase in the demand and usage of electricity from the grid when the turbines are not operational. However, once in operation, the Proposed Development will export energy to the grid providing it with more electricity during shortages. Therefore, this impact is deemed to be ***positive, imperceptible,*** and ***long-term effect***.

No gas connection is being sought for the site. However, the proposed two additional turbines will generate an increase in the natural gas consumption. Therefore, the impact is deemed to be ***neutral, imperceptible,*** and ***long-term effect***.

Broadband bandwidth demand remains largely similar given that the Proposed Development will be reliant on the permitted installations of Phase 1. Therefore, the impact is deemed to be ***neutral, imperceptible,*** and ***long-term effect***.

14.6 Mitigation Measures

14.6.1 Construction Phase

All possible precautions shall be taken to avoid unplanned disruptions to any services or utilities during the construction phase of the Proposed Development. It should be noted that a number of mitigation measures proposed in other EIAR chapters are also of relevance to Material Assets and should be referred to when reading this EIAR.

The construction phase mitigation measures include avoidance, reduction and remedy measures as set out within the Development Management Guidelines document. The design and construction of the necessary service infrastructure will be in accordance with relevant codes of practice and guidelines. This is likely to mitigate any potential impacts during the operational phase of the Proposed Development. However, routine maintenance of the site services will be required from time to time. As such, any mitigation measures will be advised by the relevant service provider.

Caution will be exercised with construction surface water runoff towards the existing ditches. Appropriate slit trenching and silt fences will be in place to filter surface water runoff.

The Contractors will maintain a protected Hazard Zone around the existing overhead 110kV transmission lines, extending 10m horizontally from the line of the outermost cable for the duration of the works. This Hazard Zone will include dedicated crossing points height limited to a maximum of 4.2m with a maximum width of 9m. The Hazard Zone will be protected by bollards spaced at no more than 6m apart with warning signs every 20m.

Within the Hazard Zone an Exclusion Zone will be maintained around the individual cables of 4.5m. This line must never be breached to avoid the risk of electrical arcing or flashover.

- All works will be carried out in accordance with ESB networks methods and standards.
- Live connections to the existing networks will only be made by ESB networks.

The contractor will prepare and implement a Construction Management Plan which will outline the requirements for the storage and handling of fuel, including the refuelling of vehicles in designated refuelling zones to minimise the risk of spillages, and the impact of spillages should they occur.

14.6.2 Operational Phase

Mitigation by design will include the surface water attenuated privately in an underground attenuation system in the southern part of the site. It will discharge to the existing ditches at a controlled greenfield runoff rate limited to 16.04l/s. The permitted Phase 1 drainage also includes Class 1 bypass interceptors and full retention petrol interceptors before surface water outfalls to the existing ditch. In addition, SuDS devices such as swales will reduce and slow down the rate of surface water runoff from the site. This will minimise peak flows in the downstream system during major storm events. Gullies and the pump set shall be regularly maintained to avoid blockages.

It is not envisaged that any other remedial or reductive measures will be necessary upon the completion of the development for electricity, gas and telecommunications.

14.7 Monitoring or Reinstatement Measures

14.7.1 Construction Phase

Any existing roads, footpaths and park spaces that are opened to facilitate electricity, gas and telecommunications connections will be reinstated. No further reinstatement will be required regarding services / utility. Residual impacts on services and utilities are considered to be **imperceptible.**

14.7.2 Operational Phase

Prior to the operational phase of the Proposed Development, all services / utility connections will be tested by a suitably qualified professional under the supervision of the service provider.

Any monitoring of the built services required during the operational phase of the Proposed Development will be as advised by the relevant service provider.

14.8 Residual Effects of the Proposed Development

14.8.1 Construction Phase

There are no environmental impacts envisaged as part of the proposed works provided all mitigation measures are fully implemented. This should include any mitigation measures proposed in respect of flora and fauna which is dealt with separately in this report. Caution will be exercised with construction surface

water runoff towards the existing ditches. Appropriate slit trenching and silt fences would be in place to filter runoff. Damage could be caused to existing services during excavation.

There will be a minor water demand for site offices. Damage could be caused to existing services during excavation.

Due to the proposed mitigation measures outlined above, the impact of the proposed work on the ESB Network will not be significant.

There may be temporary interruptions to supply while the tie-ins to the existing networks are being made.

Overall, the implementation of the proposed mitigation measures will ensure the residual impact on utilities will be ***temporary***, ***imperceptible*** and ***neutral***.

14.8.2 Operational Phase

Once operational, the Proposed Development will export electricity to the grid and will play role in stabilizing electricity supply during periods of heightened demand or potential shortages. The increase in demand in the telecommunications network will be minimal given that the Proposed Development will be reliant on the permitted Phase 1 infrastructure.

Whilst there is no Gas Networks connection proposed the proposed two additional turbines will generate an increase in the natural gas consumption for the site. Therefore, the impact is deemed to be ***neutral, imperceptible,*** and ***long-term effect***.

The water supply requirements under the permitted Phase 1 development took into account the water demand for the entire masterplan lands, which includes the subject Phase 2 development. As such, there are no additional water supply requirements for the subject Phase 2 development besides the increase in operational staff from Phase 1 (10 no. staff) which will be accommodated within the Phase 1 welfare facilities.

Additionally, there will be a positive residual impact resulting from the distribution of energy to the grid as a result of proposed operations.

14.9 Cumulative Impacts of the Proposed Development

14.9.1 Construction Phase

There are no environmental impacts envisaged as part of the proposed works provided all mitigation measures are fully implemented.

The 2 no. additional turbines proposed as part of the Phase 2 development will require a separate / additional 400kV grid connection. Accordingly, it is anticipated that the applicant will submit an application for a new gridline in due course. The proposed Phase 2 development will result in a slight increase in the demand and usage of electricity from the grid when the turbines are not operational. However, once in operation, the Proposed Development will export energy to the grid. Therefore, this future 400kV grid connection is deemed to have a ***neutral***, ***imperceptible***, and ***no long-term effect***.

14.9.2 Operational Phase

During the operational stage, there would be a minor increased load on the local Water, Storm and ESB network. However, it is anticipated that ongoing upgrades to local existing infrastructure, as well as the implementation of new infrastructure should alleviate any adverse impacts on the existing networks.

14.10 References

- BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites
- Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment
- Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
- Dublin City Council (DCC) (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition
- Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (2024) Air Quality in Ireland 2022 (& previous annual reports)
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Government of Ireland (2023) Clean Air Strategy for Ireland
- Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)
- Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)
- Met Éireann (2024) Met Éireann website: https://www.met.ie/
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
- Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107
- UK Office of Deputy Prime Minister (ODPM) (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)
- World Health Organisation (2021) Air Quality Guidelines 2021

Chapter 15 – Material Assets – Waste Management

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15. MATERIAL ASSETS – WASTE MANAGEMENT

15.1 Introduction

This chapter evaluates the impacts, if any, which the Proposed Development may have on Material Assets - Waste as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the EPA 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports during the construction and operational phases of the Proposed Development, as described in Chapter 2 (Description of Proposed Development).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN to guide and manage the waste generated during the construction phase of the Proposed Development and will be included as Appendix 15.1. 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)*.

The RWMP should be viewed as a live document and is regularly being revisited throughout the project's lifecycle so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible.

This 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). It should be read in conjunction with Chapter 2 (Description of Proposed Development), Chapter 5 (Land, Soils and Geology), and Chapter 16 (Interactions) of the EIAR.

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

15.2 Methodology

The assessment of the impacts of the Proposed Development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

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 and excavation); and
- 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 and operational phases of the Proposed Development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the Proposed Development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 15.6.

A detailed review of the existing ground conditions on a regional, local and site-specific scale is presented in Chapter 5 of this EIAR (Land, Soils & Geology). Chapter 5 also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the Proposed Development.

15.2.1 Legislative and Policy Framework

Waste management in Ireland is subject to EU and national 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 Acts 1996-2021. European and national waste management policy is based on the concept of the 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 15-1).



Figure 15-1 **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 15-2).



Figure 15-2 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 (WAPCE) – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021)* to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

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 document*s, Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)* 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 *National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024)*, *BS 5906:2005 Waste Management in Buildings – Code of Practice*, the Fingal County Council (FCC) *'Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws' (2020)*, the *EPA National Waste Database Reports 1998 – 2020,* the *Circular*

Economy and National Waste Database Report 2021-2022 (2024) and the *EPA National Waste Statistics Web Resource.*

Regulation 27 of the European Communities (Waste Directive) Regulations 2011 (SI No.126 2011) will be utilised as part of this development. Regulation 27 sets out the conditions for production residue to be classified as a by-product rather than a waste, the four conditions of being a by-product as defined under Article 27 are required to be met. These four conditions are:

- The further use of the substance or object is certain; (Article 27(1)(a));
- The substance or object can be used directly without any further processing other than normal industrial practice; (Article 27(1)(b));
- The substance or object is produced as an integral part of a production process; (Article 27(1)(c)); and
- The further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts (Article 27(1)(d)).

15.2.1.1 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

15.2.2 Forecasting Methods and Difficulties Encountered

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Site Investigation (SI) process provides spot samples, and further testing may be required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There are a number of licensed, permitted and registered waste facilities in the Dublin region, in the surrounding counties, the Eastern Midlands Waste Region (EMR) and in Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can important as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

15.3 Receiving Environment

In terms of waste management, the receiving environment is largely defined by FCC a 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 NWMPCE 2024 – 2030 and the Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland.

The waste management plans set out the following targets for waste management in the region:

- *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 Regional Waste Management Planning Offices have issued a National Waste Management Plan for a Circular Economy 2024 - 2030 in March 2024, which supersedes the Eastern-Midlands regional waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The *Fingal Development Plan 2023 – 2029* sets out the objectives for the FCC area which reflect those sets out in the regional waste management plan and can be found in Appendix 15.1.

In terms of physical waste infrastructure, FCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR Waste Region, Ireland and Northern Ireland 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.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

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.

15.4 Characteristics of the Proposed Development

The Proposed Development comprises the construction of two additional gas turbines with an output of 340 Megawatts (MW) per turbine, with a total additional output of 680 Megawatts to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11.

A full description is included in Chapter 2 of this EIAR and in the statutory notices.

The characteristics of the Proposed Development that are relevant in terms of waste management are summarised below.

15.4.1 Demolition Phase

There will be no demolition work associated with this development.

15.4.2 Construction Phase

During the excavation and 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.

The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 63,856 m^3 of material (comprising 10,200m^3 of topsoil and 53,656m^3 of other material) will need to be excavated to do so. It is currently envisaged that none of this excavated material will be reused on site due to limited opportunities for reuse, meaning the full volume will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal.

All excavated material requiring removal from the site will be deemed to be a waste. Its removal and subsequent reuse, recycling, or disposal 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 27 of the European Communities (Waste Directive) Regulations 2011, as amended. For further details in relation to the envisaged management of by-products, refer to the RWMP (Appendix 15.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones if 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 RWMP (Appendix 15.1). 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 15-1.

Table 15-1 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	129.9	10	13.0	80	103.9	10	13.0
Timber	110.2	40	44.1	55	60.6	5	5.5
Plasterboard	39.4	30	11.8	60	23.6	10	3.9
Metals	31.5	5	1.6	90	28.3	5	1.6
Concrete	23.6	30	7.1	65	15.4	5	1.2
Other	59.1	20	11.8	60	35.4	20	11.8
Total	**393.7**		**89.4**		**267.3**		**37.0**

15.4.3 Operational Phase

Following construction, it is anticipated the operational phase of the development will generate a range of non-hazardous wastes.

Segregation of Waste Materials Onsite

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in designated, easily accessible areas of the site. It is envisaged that waste types will be generated by staff employed at the facility and from office administration work.

The total estimated waste generation for the Proposed Development for the main waste types, based on the AWN waste generation model (WGM) and data from the already permitted, not yet constructed, buildings onsite, is presented in Table 15-2, and is based on the uses and areas as advised by the Project Architects.

Table 15-2 Estimated Waste Generation During Operational Phase Main Waste Types

Waste Type	Waste Volume (m^3 / week)
General Waste – *20 03 01*	0.01
Dry Mixed Recyclables - *15 01 06*	0.13
Confidential Paper - *20 01 01*	0.02
Biodegradable Food Waste- *20 01 08*	0.15
Total	**0.31**

Dedicated waste storage areas (WSA) along with a facility operational waste management system for the sorting, storing and collection of waste will be in place for the permitted development (Phase 1). It has been designed to maximise recycling rates and minimise waste across the entire centre.

All waste receptacles stored on site will be collected from the service yard or waste storage rooms by the permitted waste contractor and taken to registered, permitted and/or licensed facilities.

15.4.4 Decommissioning Phase

The lifespan of the Proposed Development is proposed to be 25 years. At the end of this period, a detailed Decommissioning Plan will be prepared prior to the commencement of decommissioning works.

This plan will outline the procedures for safe dismantling or demolition, prioritising reuse and recycling of materials in accordance with the Waste Management Act 1996 (as amended), EPA guidance and FCC Waste Bye-Laws.

Measures will be implemented to prevent any waste-related nuisance, including dust, noise, or litter, at nearby sensitive receptors. All waste streams will be segregated, documented, and managed by authorised waste contractors, ensuring compliance with local and national requirements. Lessons learned from the construction and operational phases will inform best practice during decommissioning.

15.5 Potential Impacts of the Proposed Development

15.5.1 Construction Phase

The Proposed Development will generate a range of non-hazardous and hazardous waste materials during site works. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative.***

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant*** and ***negative.***

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the Southern Region 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 topsoil and subsoil will need to be excavated to facilitate the Proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale is presented in Chapter 5. All excavated material will be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative.***

15.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant*** and ***negative***.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

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 knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant*** and ***negative***.

It is anticipated that waste contractors will be required to service the Proposed Development on a scheduled basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant*** and ***negative***.

15.5.3 Decommissioning Phase

The lifespan of the Proposed Development is proposed to be 25 years. At the end of this period, when closure becomes necessary, a range of non-hazardous and hazardous waste materials will be generated during site works. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by demolition employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative*****.**

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be ***long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the Southern Region 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***.

15.6 Mitigation Measures

This section outlines the measures that will be implemented to reduce waste generation, manage waste responsibly and minimise environmental effects. All mitigation measures are guided by the principles of the 'Waste Hierarchy' and 'Circular Economy'. The waste hierarchy sets out waste management options in order of preference, from most to least preferred, based on environmental impact and compliance with EU and national policy: prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, as a last resort, disposal. The circular economy principle aims to keep materials, components, and products in-use for as long as possible, designing systems that create and retain value. Both principles have been applied and will further be applied during the detailed design, construction and operational phases.

The waste management objectives for the Proposed Development are as follows. These measures will facilitate material reuse and recycling, where possible, and seek to divert waste from landfill:

- Prevention (Construction Phase): The Main Contractor will prevent and minimise waste generation where possible by ensuring large surpluses of construction materials are not delivered to the site through coordination with the suppliers, operating a 'just-in-time' delivery scheme and ensuring sub-contractors conform to the Contractor(s) Construction Environmental Management Plan (CEMP). The CEMP submitted with this application (under separate cover) outlines the overarching principles, and a more detailed, site-specific version will be prepared by the Main Contractor prior to the commencement of the works;
- Reuse (Construction and Operational Phases): Reuse of waste and surplus materials will be prioritised during construction, with efforts made to repurpose materials in high value applications. During the operational phase, reuse will be encouraged through appropriate waste segregation and management practices within the Proposed Development;
- Recycle (Construction and Operational Phases): Recycling will be implemented during construction, including the potential use of on-site crushers to produce waste-derived aggregates, subject to testing and approvals. During operation, recycling facilities will be provided to support resident and commercial waste segregation in line with FCC requirements and national waste policy.; and
- Disposal (Construction and Operational Phases): Where waste disposal is unavoidable, it will be carried out in accordance with the Waste Management Act 1996, as amended, and relevant guidance. This applies to both construction waste and operational waste streams, with licensed waste contractors used for all disposal activities.

15.6.1 Construction Phase

The waste management objective will be to prevent waste arising in the first place, and to re-use, recycle or recover waste materials where possible. The following mitigation measures will be undertaken for the construction phase of the Proposed Development regarding waste management:

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 15.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of the 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 15.1) in agreement with FCC and in compliance with any planning conditions, or submit an addendum to the RWMP to FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream; and

- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases and should treat the document as outlined in the guidance as a live document

A quantity of topsoil and sub soil will need to be excavated to facilitate the Proposed Development. The Development Engineers have estimated that the full volume of excavated material will need to be removed off-site due to limited opportunities for reuse. 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 where possible 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; and
- Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A 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.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 (By-products), as amended, European Union (Waste Directive) Regulations 2011-2020. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the Proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997 and the NWCPE. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

15.6.2 Operational Phase

The following mitigation measures will be implemented during the operational phase of the Proposed Development:

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 Operator will be responsible for allocating personnel and resources, as needed to ensure the ongoing implementation of this site's current Operational Waste Strategy. This will include maintaining a high level of recycling, reuse and recovery at the site.

The Operator will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site;

On-site segregation of all waste materials into appropriate categories including (but not limited to):

- Organic waste;
- Dry Mixed Recyclables;
- Mixed Non-Recyclable Waste;
- Glass;
- Cardboard;
- Plastic;
- Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
- Batteries (non-hazardous and hazardous);
- Oil and oil filters
- Light bulbs;
- Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- Furniture (and from time-to-time other bulky waste).

The Operator and staff will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;

The Operator and staff will ensure that all waste collected from the Site of the Proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and

The Operator and staff will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter*

Pollution Act 1997, *The NWMPCE* and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

15.6.3 Decommissioning Phase

As per Section 15.6.1.

15.7 Monitoring Measures

The management of waste during the construction phase will be monitored by the Contactor's appointed RM to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator and staff to ensure effective implementation of the mitigation measures outlined in Section 15.6.2 both internally and by the nominated waste contractor(s).

Table 15-3 Monitoring Proposals

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits.
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of Waste Classification	An appointed Resource Manager will monitor all on-site waste segregation and classification.
Unlicensed Waste Collection (Illegal Dumping)	The operator will maintain waste receipts on-site for a period of 7 years and make available to FCC as requested.
Poor Waste Segregation	Waste generation volumes and cross contamination will be monitored by the operator and their selected waste management company.
Litter Pollution	Waste storage areas will be monitored by the operator and their staff.

15.7.1 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 excavation and construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets.

The management of waste during the construction phase shall be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the RWMP, including maintenance of waste documentation.

The mitigation measures in the RWMP specify the need for a 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 RM shall identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the construction phase will enable better management of waste contractor requirements and identify trends. The data will be maintained to advise on future projects.

15.7.2 Operational Phase

The management of waste during the operational phase shall be monitored to ensure effective implementation of mitigation measures by the operator and the nominated waste contractor(s). Waste generation volumes shall be monitored against the predicted waste volumes outlined in the table 15-2.

15.8 Residual Effects of the Proposed Development

The implementation of the mitigation measures outlined in Section 15.6 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the Proposed Development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

15.8.1 Construction Phase

A carefully planned approach to waste management as set out in Section 15.6.1 and adherence to the RWMP (which includes mitigation) (Appendix 15.1) during the construction phase will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction phase on the environment will be ***short-term, imperceptible*** and ***neutral.***

15.8.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 15.6.2 will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be ***long-term, imperceptible*** and ***neutral.***

15.8.3 Decommissioning Phase

When the mitigation measures outlined in the Decommissioning Plan are implemented, including prioritisation of reuse and recycling, the predicted impact of the decommissioning phase on the environment will be ***short-term, imperceptible*** and ***neutral***.

15.9 Cumulative Effects of the Proposed Development

15.9.1 Construction Phase

The Proposed Development is located within an area that has experienced substantial industrial and commercial growth in recent years, particularly along Kilshane Road and the surrounding business parks. Multiple planning applications remain in place for large-scale warehouse, logistics, and associated infrastructure developments, as well as mixed-use and residential projects within the wider Finglas and Kilshane area.

Given the scale and nature of these developments, there is the potential for overlapping construction phases or concurrent operational activities, which could result in cumulative impacts on construction waste generation, material sourcing and disposal capacity. Similarly, during operation, cumulative impacts may

arise from increased volumes of packaging waste, general commercial waste, and associated resource use within the area.

As part of the assessment of the impact of the Proposed Development, account has been taken of relevant related developments that are currently permitted, or under construction within the area surrounding the Proposed Development site. A list of relevant planning permissions from the area surrounding the Proposed Development within the previous five years is shown in Appendix 2.1 while a list of Relevant Projects Identified with Potential for Cumulative Effects is presented in Chapter 2, Section 2.10.1. This assessment considers the combined effect of the Proposed Development alongside the permitted developments listed in Table 15-5, with respect to waste arisings, segregation, reuse / recycling opportunities and disposal routes. While specific disposal routes will be confirmed by the appointed waste contractors during construction, the availability of licensed facilities in the Dublin area (refer to Appendix A of the RWMP, Appendix 15.1 of the EIAR) ensures that appropriate routes and destinations are accessible for all waste streams.

In addition to the developments listed in Table 15-5, it is noted that the Proposed Development will require a future 400 kV grid connection. This connection is anticipated to involve a separate planning application. The final routing and design characteristics will be confirmed during the detailed design stage. This future infrastructure forms part of the cumulative assessment as it represents an additional element within the zone of influence of the Proposed Development.

Table 15-4 Selection of Local Planning Permissions. Full Listing in Appendix 2.1.

Planning Ref. and/or ABP	Project Type	Date of Grant
FCC Reg. Ref.: FW25A/0086E	Infrastructure / Security Upgrade (specifically perimeter fencing works at power station)	Permission Granted 5th June 2025
FCC Reg. Ref.: FCC24A/0178E	Industrial / Commercial Development (business park units with office fitouts and site works)	Permission and Retention Granted 10th January 2025
FCC Reg. Ref.: FW23A/0269	Industrial Development (extension of existing industrial unit and associated site works)	Permission Granted 13th of February 2024
DCC Reg. Ref.: 4308/22	Residential Development (construction of a new dwelling and associated assess/parking works)	Permission Granted 28th June 2023
FCC Reg. Ref.: FW23A/0052	Industrial / Commercial Development (warehouse development with associated amenities and signage)	Permission Granted 9th June 2023
ABP: PL29.311424 / DCC Reg. Ref.: 3913/20	Mixed-Use Development (combination of commercial, coffee shop and residential duplex apartments)	Permission Granted 31st January 2023
FCC Reg. Ref.: FW2A/0206	Industrial / Commercial Development (warehouse development with modifications and retention)	Permission and Retention Granted 12th December 2022

Planning Ref. and/or ABP	Project Type	Date of Grant
FCC Reg. Ref.: FW21A/0233	Industrial / Commercial Development (modifications and extension to an existing business unit)	Permission Granted 8th March 2022
FCC Reg. Ref.: FW21A/0146	Warehouse / Logistics Facility (large-scale logistics unit with associated infrastructure and amenities)	Permission Granted 15th of February 2022
FCC Reg. Ref.: FW21A/0096	Industrial Development – Ancillary Plant Installation for Logistics Facility	Permission Granted 17th of August 2021
FCC Reg. Ref.: FW20A/0211	Industrial Development – Warehouse / Logistics Units (large-scale logistics development forming part of a business park)	Permission Granted 19th May 2021
FCC Reg. Ref.: FW19A/0143	Industrial Development – Warehouse Units with Ancillary Offices (medium-scale industrial / warehouse development)	Permission Granted 19th March 2020
FCC Reg. Ref.: F18A/0146	Industrial Development – Storage and Distribution Facility (Automotive) (large-scale logistics / distribution project specifically for vehicle storage and processing)	Permission Granted 9th April 2019

Due to the high number of permitted waste contractors operating within Dublin area, as listed in Appendix A of the RWMP (Appendix 15.1 of the EIAR) and registered with the National Waste Collection Permit Office (NWCPO) and Environmental Protection Agency (EPA), there is sufficient capacity to manage waste generated from multiple sites simultaneously, if required. It is anticipated that similar waste streams (e.g. excavated soils, concrete, timber, metals and packaging materials) would be generated across these developments, allowing for consistent segregation and recycling practices.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the cumulative effect will be ***short-term, not significant*** and ***neutral.***

15.9.2 Operational Phase

During the operational phase, cumulative effects may arise from increased volumes of packaging waste, general commercial waste, and associated resource use within the wider Kilshane and Finglas area. However, given the availability of licensed waste contractors and recycling facilities in the Dublin region (see Appendix A of the RWMP), and the implementation of site-specific waste management procedures in accordance with best practice and legislative requirements, the cumulative effect on waste infrastructure is considered not significant. All developments, including the Proposed Development, will be required to comply with relevant waste legislation and ensure segregation, reuse, and recycling of materials wherever possible. As such the cumulative effect will be ***long-term, imperceptible*** and ***neutral.***

15.9.3 Decommissioning Phase

The Proposed Development is expected to have a lifespan of 25 years. At the end of this period, decommissioning activities will involve dismantling or demolition of structures and removal of associated infrastructure.

Given the nature of the surrounding developments, it is possible that other sites may also undergo decommissioning in the future, which could result in cumulative waste generation. However, all such activities will be required to comply with national and local waste legislation, including segregation, reuse, and recycling of materials wherever feasible.

Licensed waste contractors and recycling facilities within the Dublin region provide sufficient capacity to manage waste arising from multiple decommissioning projects concurrently. Therefore, the cumulative effect of decommissioning on waste infrastructure is predicted to be ***short-term, not significant*** and ***neutral.***

15.10 References

- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Circular Economy and Miscellaneous Provisions Act 2022.
- 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.
- DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021).
- Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
- Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002).
- 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, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
- Directive (EU) 2018/2001 *The Promotion of the Use of Energy from Renewable Sources* (2018).
- DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002).
- DoEHLG, *Taking Stock and Moving Forward* (2004).
- DoHLGH, *Design Manual for Urban Roads and Streets* (2019). DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021).
- Environmental Protection Agency Act (EPA) 1992 as amended.
- EPA *'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).*
- EPA, *National Waste Database Reports 1998 – 2020* and the Circular *Economy and National Waste Database Report 2021 – 2022.*
- EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).
- EPA, *European Waste Catalogue and Hazardous Waste List* (2002).
- EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018).
- European Commission, *Guidelines for the waste audits before demolition and renovation works of buildings* (May 2018).
- European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
- FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and* site *Managers* (2002).
- Fingal County Council (FCC), *Fingal County Development Plan 2023 – 2029* (2023).
- FCC, Segregation Storage, Presentation and of Household and Commercial Waste (2020).

- Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
- Litter Pollution Act 1997 as amended.
- Local Government Ireland, *the Best Practice Guidance for Handling Asbestos (2023).*
- Regional Waste Management Planning Offices, The National Waste Management Plan for a Circular Economy 2024 - 2030 (2024).
- Waste Management Act 1996 as amended.
- Waste Management (Landfill Levy) Regulations 2015 (as amended).

Chapter 16 – Interactions

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16. INTERACTIONS

16.1 Introduction

This chapter of the EIA Report in accordance with the guidance, the potential interactions and inter-relationships between the environmental factors discussed in the preceding chapters. This covers both the construction and operational phase of the Proposed Development.

Directive 2011/92/EU, as amended by Directive 2014/52/EU, and section 171A of the Planning and Development Act, as amended, both provide that an EIA shall identify, describe and assess in an appropriate manner, in the light of each individual case, the interaction between the following factors:

- human beings, fauna and flora population and human health;
- biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- land, soil, water, air and climate and landscape;
- material assets, cultural heritage and the landscape.

This chapter has been produced following the requirements of the EIA Directive and *Planning and Development Act 2000,* as amended. The contents of the chapter have been prepared following *European Commission 'Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report'* (2017) and the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022).

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the EPA 2022 Guidance as outlined in Chapter 1 (Introduction). This section of the assessment presents a summary and assessment of the identified interactions.

16.2 Human Health and Populations, and its Interaction with:

16.2.1 Land, Soils, and Geology

Construction Phase

The potential interactions between human health and populations and land, soils and geology during construction phase include the low risk of soil contamination, which could in turn lead to adverse effects on human health through exposure to contaminated material. Adherence to the mitigation measures outlined in Chapter 5, together with the implementation of the submitted CEMP, will effectively reduce the risk of soil contamination. In addition, the proper identification and management of contaminated soil will safeguard against potential impacts on human health.

The implementation of the mitigation measures stated in Chapter 5 and in the submitted CEMP will ensure interactions between Population and Human Health, and the environmental factor of Land, Soils, Geology and Hydrogeology are ***neutral, imperceptible*** and ***short-term*** during construction phase.

16.2.2 Hydrology and Hydrogeology

Construction Phase

Due to the lack of a source pathway linkage to any drinking water receptors or local bathing areas the potential interaction between Population and Human Health and the environmental factor of Hydrology and Hydrogeology is ***neutral, imperceptible*** and ***short-term*** during construction phase.

Operational Phase

The Proposed Development represents an increase in hardstand. However, the Proposed Development includes for SuDS designed to provide a 20% climate change allowance and the flood risk assessment undertaken by Waterman Moylan for the site demonstrates that there will be no offsite flooding as result of proposed works. The interaction between human health and populations and hydrology and hydrogeology is considered to be ***long-term, imperceptible*** and ***neutral*** during operations.

16.2.3 Air Quality

Construction Phase

The construction phase of the Proposed Development will have a potential negative effect on the air quality and may negatively impact Population and Human Health if appropriate mitigation measures are not implemented, primarily due to short-term dust nuisance.

Taking into account the construction phase mitigation measures set out in Chapter 8 of this EIAR, there is no potential for significant interaction between population and human health, and air quality. Adherence to the mitigation measures outlined in this EIAR will ensure interactions are no greater than ***negative, not significant*** and ***short-term***.

Operational Phase

Once operational, the Proposed Development will include for two new gas peaking turbines which will emit nitrogen oxides (NO_X), carbon monoxide (CO), sulphur dioxide (SO_2) and particulate matter (as PM_{10} and $PM_{2.5}$) potentially causing impacts to air quality and human health. However, emissions of air pollutants during the operational phase are predicted to be below the relevant ambient air quality standards, which are based on the protection of human health with no potential for significant impacts.

Residual effects to human health related to air quality will be ***negative***, ***not significant,*** and ***long-term*** during operations, which is overall not significant in EIA terms***.***

16.2.4 Noise and Vibration

Construction Phase

During the construction phase of the Proposed Development, a variety of plant items will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators. There will be also an increase in traffic during construction phase that could lead to an increase in traffic-related noise. However, the application of noise and vibration limits and binding hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that negative interactions are kept to a minimum.

Adherence to the mitigation measures set out in Chapter 10 of this EIAR will result in a ***direct, negative, not significant*** and ***short-term*** interaction between population and human health and noise and vibration during the construction phase of the Proposed Development.

Operational Phase

Increasing industrial activity has the potential to increase ambient noise levels at nearby sensitive human receptors – dwellings and amenities. However, design and appropriate mitigations have been included as part of Proposed Development design. Modelling for cumulative impact of the permitted and Proposed Development in relation to noise increase at the nearest noise sensitive locations concludes that the interaction with Human Health will be ***direct, neutral, not significant*** and ***long-term.***

16.2.5 Landscape and Visual Impacts

Construction Phase

It is considered that the introduction of new structures, access roads, machinery, materials storage, associated earthworks, car parking, lighting and hoarding will impact negatively on Population and Human Health. The overall impact on the community will be ***negative, slight,*** and ***short-term*** for landscape changes, and ***negative, moderate,*** and ***short-term*** for visual intrusion.

Operational Phase

The Proposed Development will represent an intensification of the permitted Phase 1 development and is therefore considered to be a consistent form of development in the context of the overall study area. The Proposed Development tends to be well screened and where visible, will not detract notably from the prevailing robust industrial character of the surrounding landscape. Visual operational interaction with human health is deemed to be ***negative, imperceptible to moderate*** and ***long-term***, while interactions from the landscape change are deemed ***moderate, neutral to negative,*** and ***long-term.***

16.2.6 Material Assets, including Utilities, Waste Management and Transport

Construction Phase

During construction connections to surface water drainage, water supply, wastewater drainage, power supply, telecommunications infrastructure and road infrastructure will be required. Any interruptions to these utilities could impact on the local population. Consultation with service providers and adherence to the CEMP will avoid any negative impacts on the local population.

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 14 will ensure appropriate management of waste and avoid any negative impacts on the local population.

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. During construction of the Proposed Development there will be an increase in vehicle and HGV movement that could lead to negative interactions with population and human health.

During construction phase, the contractor will be obliged to adhere to the submitted CEMP, RWMP, Traffic Management Plan and to the mitigation measures detailed in Chapters 13, 14 and 15 of this EIAR, resulting in a ***neutral, imperceptible, short-term*** and interaction between Material Assets and Population and Human Health.

Operational Phase

Once operational, the Proposed Development will provide for additional power generation capacity and will play a vital role in preventing power disruptions and enhancing electricity supply security, particularly when renewable energy generation capacity faces limitations. This will result in a ***positive, slight*** and ***long-term*** interaction between population and utilities during the operational phase.

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to

waste management and adherence to existing waste plans for the site and mitigation measures in Chapter 14 will ensure appropriate management of waste and avoid any negative impacts on the local population.

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. An assessment of the additional traffic movements associated with the Proposed Development show that development traffic will not impact negatively on the junction's operational performance.

Provided the mitigation measures detailed in Chapters 14 and 15 are adhered to, the interaction between Material Assets – Waste, Traffic and Transportation and Population and Human Health will be ***neutral, imperceptible*** and ***long-term*****.**

16.3 Land, Soils and Geology, and its Interaction with:

16.3.1 Hydrology and Hydrogeology

Construction Phase

The construction phase of the Proposed Development has the potential for accidental silt laden material or polluted water to discharge temporarily to ground or surface water run-off which could have localised impact on the underlying. As the contractor will be obliged to operate in compliance with the CEMP and mitigation measures outlined in in Section 6.6 – Chapter 5 & 6 – Hydrology and Hydrogeology, the interaction is considered to be ***negative, slight***, and ***short-term.***

Operational Phase

During operation, there is no significant additional storage of potential pollutants on the Proposed Development site, the majority of the site will be capped by hardstand/building and a drainage system will be installed which features SUDs design measures including oil interceptors and attenuation. The site will be required to operate in compliance with an IED licence which requires checking of containment and monitoring of discharges Therefore, there is no potential for accidental discharges to ground to contaminate the local soils, underlying aquifer and Huntstown stream. The interaction is considered to be ***neutral***, ***imperceptible***, and ***long-term.***

16.3.2 Biodiversity

Construction Phase

In the absence of mitigation, there is potential for silt laden material or polluted water to to discharge temporarily into the Huntstown stream and impact on local biodiversity. Based on the likely loading and distance toEuropean sites downstream there is no likely impact on these downgradient habitats. Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Taking into account the requirement for the contractor to operate in accordance with a CEMP and mitigation measures set out in Chapters 5, 6 and 7 of this EIA Report, the interaction is considered to be ***negative, slight***, and ***short term.***

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Biodiversity during the operational phase.

16.3.3 Air Quality

Construction Phase

Construction phase activities such as land clearing, excavations and stockpiling of materials etc. have the potential for interactions between air quality and the land, soils and geological environment in the form of dust emissions. As there is a requirement for the contractor to operate in accordance with a CEMP this included measures to prevent fugitive dust emissions from construction activities including excavation of soils.

Taking into account the design and mitigation measures set out in this EIA Report, there is potential for neutral interaction between Land, Soils and Geology, and Air Quality during the construction phase. The interaction is considered to be ***negative, not significant*** and ***short term.***

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Air Quality during the operational phase.

16.3.4 Climate

Construction Phase

Construction phase activities such as land clearing, excavations and stockpiling of materials etc. have the potential for interactions between climate and the land, soils and geological environment in the form of GHG emissions. Mitigation measures are included in the design to prevent fugitive GHG emissions from construction activities including minimising excavation of soils. The effect of the interactions between climate and land, soils, geology and hydrology are ***negative, imperceptible,*** and ***short-term*** during the construction phase

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Climate during the operational phase.

16.3.5 Material Assets

Construction Phase

During the construction phase, excavated soil, stone and clay will be generated from the excavations required to facilitate site levelling, construction of new foundations and the installations of site services. It is envisaged that some of the excavated material will need to be removed off-site. When material has to 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, and Geology), Chapter 14 (Material Assets – Waste Management), will ensure the effect is ***neutral, not significant*** and ***short-term.***

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Climate during the operational phase.

16.4 Hydrology and Hydrogeology, and its Interaction with:

16.4.1 Land, Soils and Geology

Construction Phase

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or be locally polluted from accidental spillages. These accidental emissions may migrate into the ground and the local geology if not mitigated against. The design measures and mitigation measures (outlined in Chapters 6 and 7) will be implemented by the construction contractor to ensure that there is no change in the overall water regime at water dependent habitats on and in the vicinity of the site.

As there is a requirement for the contractor to operate in accordance with a CEMP and t into account the mitigation measures set out in Chapters 6 and 7 of this EIA Report, the interaction between Land, Soil and Geology and Hydrology and Hydrogeology during the construction phase is ***negative, slight*** and ***short-term*****.**

Operational Phase

There will be no direct discharge or potential for discharge to ground as the site is capped and surface water drainage system in place during operation. The interaction is considered to be ***neutral, imperceptible*** and ***long-term.***

16.4.2 Biodiversity

Construction Phase

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or otherwise become polluted from accidental spillages. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which if not adequately mitigated could impact on downstream water quality and habitats local to the site.. As there is a requirement for the contractor to operate in accordance with a CEMP and including consideration of mitigation measures (outlined in Chapters 6 and 7) there is no likely expected impact on any sensitive water dependent habitats.

Taking into account the design and mitigation measures set out in Chapters 6 and 7 of this EIA Report, the interaction between Hydrology and Hydrogeology, and Biodiversity during the construction phase is ***negative***, ***slight*** and ***short-term***.

Operational Phase

Surface water will be discharged offsite to the Ward_030 river located along the sites Eastern and Southern boundaries at greenfield run-off rate. The Proposed Development surface water drainage system has been designed with SUDs features, and all discharged water will pass through oil interceptors prior to exiting the site. There will be no potential for significant negative impacts to the downstream designated sites via this hydrological pathway from the site. Monitoring of containment measures and discharge form site will be undertaken in compliance with an IED licence.

Taking into account the design measures set out in Chapters 6 and 7 of this EIA Report, the interaction is considered to be ***neutral***, ***imperceptible*** and ***long-term***.

16.4.3 Air Quality & Climate

Construction Phase

There are no potentially significant interactions identified between hydrology and hydrogeology and air or climate during the construction phase.

Operational Phase

Climate change has the potential to increase the risk of flooding in future years due to increased rainfall.

According to the flood risk assessment carried out as part of this application, the site is located within Flood Zone C (i.e., where the probability of flooding from rivers is less than 0.1% or 1 in 1000). The residual risks of any form of flooding were considered to be ***low to extremely low***.

The Proposed Development has been assessed as having a low vulnerability to climate change related flooding. The development includes the implementation of SUDS and an attenuation system that has been designed for the 1 in 100 year storm event with an allowance of 20% for climate change.

Therefore it can be determined that there is no significant risk to the Proposed Development or off site as a result of increased rainfall. The interaction is considered to be ***neutral, imperceptible,*** and ***long-term.***

16.4.4 Material Assets, including Utilities, Waste Management and Transport

Construction Phase

The installation of watermains, discharge to the Huntsown Stream and the SUDs through the use of heavy machinery, pose a potentially significant interactions identified between Hydrology and Hydrogeology, and Material Assets during the construction phase. Following the necessary codes and guidance for their installations the interactions are considered to be ***neutral, slight*** and ***short-term***.

Operational Phase

As a part of the SUDs features, it is anticipated that small amounts of hydrocarbon sludge waste and debris may be generated in the hydrocarbon interceptors which will treat the surface water run-off.

All foul water generated on the Proposed Development will be sent to the Ringsend WWTP. Therefore, there is no potential for wastewater discharge from the site to have any significant negative impact on public foul wastewater infrastructure or receiving waters.

Taking into account the design and mitigation measures set out in Chapter 6 (Hydrology), Chapter 14 (Material Assets – Utilities) of this EIA Report, there remains a residual neutral interaction between Hydrology and Hydrogeology, and Material Assets during the operational phase. The interaction is considered to be ***neutral, not significant,*** and ***long-term.***

16.5 Biodiversity and its Interaction with:

16.5.1 Land, Soils, Geology

Construction Phase

Removal of vegetation during construction will increase the risk of soil erosion and dust generation.

Taking into account the requirement for the contractor to operate in accordance with a CEMP and mitigation measures set out in Chapters 5, 6 and 7 of this EIA Report, the potential interaction between Land, Soil and Geology, and Biodiversity during the construction phase is considered to be ***negative, slight***, and ***short-term.***

Operational Phase

There are no potentially significant interactions identified between Biodiversity and Land, Soils and Geology during the operational phase.

16.5.2 Hydrogeology & Hydrology

Construction Phase

Removal of vegetation during construction will increase the risk of soil erosion and potential for silt laden stormwater to be generated.

As there is a requirement for the contractor to operate in accordance with a CEMP and including consideration of mitigation measures (outlined in Chapters 6 and 7) there is no likely expected impact on any sensitive water dependent habitats.

Taking into account the design and mitigation measures set out in Chapters 6 and 7 of this EIA Report, the interaction between Biodiversity and Hydrology and Hydrogeology during the construction phase is ***negative***, ***slight*** and ***short-term***.

Operational Phase

The Proposed Development surface water drainage system has been designed with SUDs features, and all discharged water will pass through oil interceptors prior to exiting the site. There will be no potential for significant negative impacts to the downstream designated sites via this hydrological pathway from the site. Monitoring of containment measures and discharge form site will be undertaken in compliance with an IED licence.

Taking into account the design measures set out in Chapters 6 and 7 of this EIA Report, the interaction is considered to be ***neutral***, ***imperceptible*** and ***long-term***.

16.5.3 Air Quality & Climate

Construction Phase

Removal of vegetation during construction will increase the risk of soil erosion and dust generation.

Taking into account the requirement for the contractor to operate in accordance with a CEMP and mitigation measures set out this EIA Report, the potential interaction between Biodiversity and Air and Climate during the construction phase is considered to be ***negative, slight***, and ***short-term.***

Operational Phase

Air modelling has confirmed no significant impact on offsite habitats during operation. Taking into account the requirement for the plant to operate in accordance with IED licence conditions, the potential interaction between Biodiversity and Air and Climate during the operation phase is considered to be ***neutral, imperceptible*** and ***long-term.***

16.5.1 Landscape and Visual Impact

Construction Phase

Site clearance, including the removal of vegetation, will have a negative impact on local biodiversity during the construction phase. However, these effects will be short-term. Additionally, perimeter hedgerows will be retained, and additional planting is proposed as part of the landscape plan, which will support the recovery and enhancement of local habitats. Interactions between landscape and biodiversity during construction are anticipated to be ***negative, not significant*** and ***short-term.***

Operational Phase

The retention of areas of perimeter hedgerow vegetation and the maturing of the proposed landscaping measures including planting of new hedgerow, trees, woodland meadow mix and wildflowers within the site will be of relevance to the local biodiversity. Interactions between landscape and biodiversity during operations are anticipated to be ***positive, not significant*** and ***long-term***

16.6 Air Quality and its Interaction with:

16.6.1 Population & Human Health

Construction Phase

As the contractor will be obliged to operate in compliance with a CEMP and include mitigation to ensure that the impact of the Proposed Development complies with all ambient air quality legislative limits. Therefore, the predicted impact is ***negative, localised, not significant*** and ***short-term,*** with respect to Population and Human Health during the construction phase.

Operational Phase

Vehicles accessing the site will emit pollutants. However, the increased number of vehicles associated with the Proposed Development will not cause a significant change in air pollutant emissions in the locality. Furthermore, it has been assessed that operational emissions from the proposed turbine operations will be in compliance with the ambient air quality standards which are set for the protection of human health. The likely effect will be***, negative, not significant*** and ***long-term***.

16.6.2 Climate

Construction Phase

There are no potentially significant interactions identified between Air and Climate during the construction phase.

Operational Phase

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is **no impact** on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

16.6.3 Land Soils Hydrology

Construction Phase

Construction phase activities such as construction and movement of materials by construction vehicles have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase. The impact will be ***negative, localised, not significant*** and ***short-term.***

Operational Phase

There are no potentially significant interactions identified between Air Quality, and Land & Soils during the operational phase.

16.6.4 Biodiversity

Construction Phase

Dust generation can occur during extended dry weather periods due to construction traffic. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. There are no designated ecological sites within 50 m of the Proposed Development site area. Significant dust impacts are not predicted beyond this distance. Dust mitigation measures will be implemented on site as set out in Chapter 8 of this EIAR and submitted CEMP. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be ***direct, negative, localised, not significant*** and ***short-term*** with respect to biodiversity.

Operational Phase

Air modelling has confirmed no significant impact on offsite habitats during operation. Taking into account the requirement for the plant to operate in accordance with IED licence conditions, the potential interaction between Biodiversity and Air Quality during the operation phase is considered to be ***neutral, imperceptible*** and ***long-term***.

16.6.5 Traffic & Transport

Construction Phase

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. Additionally, the movement of materials by construction vehicles may have an impact on dust emissions if not appropriately mitigated. The impacts of the Proposed Development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, it has been concluded that there is no potential for significant impacts from traffic on air quality. The implementation of the mitigation measures outlined in Chapters 8 and 13 will ensure any interactions between Air Quality and Traffic and transport are ***negative, not significant*** and ***short-term*** during the construction phase.

Operational Phase

During the Operational Phase, the development is expected to result in a minimal increase in traffic volumes, and the assessment of the annual average daily traffic is anticipated to result in a not significant change. Overall, the operational traffic levels and the mitigation measures proposed will contribute to a ***negative, imperceptible*** and ***long-term*** interaction with air quality.

16.7 Climate and its Interaction with:

16.7.1 Land, Soils, Geology and Hydrology

The impact of flood risk has been assessed, and the surface water drainage network has been designed to cater for increased rainfall in future years due to climate change. The effect of the interactions between climate and land, soils, geology and hydrology are ***direct, negative, imperceptible*** and ***short-term***

during the construction phase and ***direct, negative, imperceptible*** and ***long-term*** during the operational phase, which is overall ***not significant*** in EIA terms.

16.7.2 Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is **no impact** on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

16.7.3 Traffic and Transportation

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO_2, a greenhouse gas. The effects of the Proposed Development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effects of the interactions between traffic and climate are ***direct, negative, not significant*** and ***short-term*** during the construction phase and ***direct, negative, not significant*** and ***long-term*** during the operational phase, which is overall ***not significant*** in EIA terms.

16.7.4 Waste

Waste management measures (detailed in Chapter 14 Material Assets – Waste) will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered ***direct, negative, not significant*** and ***short-term*** during the construction phase and ***direct, negative, not significant*** and ***long-term*** during the operational phase, which is overall ***not significant*** in EIA terms.

16.8 Noise and Vibration, and its Interaction with:

16.8.1 Human Health and Population

Construction Phase

During the construction phase of the Proposed Development, a variety of plant items will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators that could lead to negative impacts to human health and local population. There will also be an increase in traffic during construction phase that could lead to traffic-related noise emissions.

However, it is anticipated that the application of noise and vibration limits and limits on the hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that negative interactions are kept to a minimum.

Adherence to the mitigation measures set out in Chapter 10 of this EIAR will result in a ***direct, negative, not significant*** and ***short-term*** interaction between population and human health, and noise and vibration during the construction phase of the Proposed Development.

Operational Phase

Increasing industrial activity has the potential to elevate ambient noise levels at nearby sensitive receptors, including residential properties. However, the Proposed Development incorporates a suite of mitigation by design measures that will substantially reduce these potential impacts, ensuring that noise levels remain within acceptable limits. Cumulative impact noise modelling has been undertaken in support of this planning application to assess the noise increase at the nearest noise sensitive locations with respect to

the Proposed Development. This modelling has concluded that noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby residential receptors. Therefore, the interaction between noise and Human Health during operations will be ***direct, neutral, not significant*** and ***long-term.***

16.8.2 Traffic and Transportation

Construction Phase

The traffic generated during the Construction Phase has the potential to impact on noise and vibration levels in the surrounding area. These effects are expected to be of short-term duration and will be carefully controlled and monitored in accordance with the mitigation measures outlined in this EIAR. Measures such as restricted working hours, use of low-noise machinery, and vibration monitoring will be implemented to minimise disturbance to nearby residents and sensitive receptors. During construction, the interactions between traffic and transportation and noise and vibration will be ***negative, not significant*** and ***short-term.***

Operational Phase

During the operational phase, traffic associated with the Proposed Development will result in a ***negative, imperceptible*** and ***long-term*** increase in ambient noise levels. However, this is expected to be not significant in EIA terms, given the projected traffic volumes and the nature of the surrounding environment. Noise levels will remain within acceptable thresholds, and the implementation of the submitted Mobility Management Plan will support strategies to reduce reliance on private vehicles, thereby helping to limit any potential increase in noise and vibration over time.

16.8.3 Material Assets – Utilities

Construction Phase

Heavy machinery used for excavations to facilitate watermains, drainage and attenuation may impact on noise and vibration. During construction noise and vibration will be controlled and monitored as set out in Chapter 10 of this EIAR, resulting in residual interactions no greater than ***negative, not significant*** and ***short-term***.

16.9 Landscape and Visual Impacts, and its Interaction with:

16.9.1 Human Health and Population

Construction Phase

The local urban landscape character is likely to experience negative impacts arising from the construction phase due to the notable increase in activity on the site, which will include HGVs travelling to and from the site, the erection of tower cranes and other typical construction stage machinery. Whilst the introduction of these highly utilitarian features on the local landscape will result in some negative effects, once proposed construction works commence, the construction for the permitted Phase 1 will be ongoing. Therefore, the proposed construction works will represent a continuation of existing construction context and is deemed to be short-term in duration. Interactions between landscape and visual impact and human health and population are expected vary depending on the distance from Proposed Development and are anticipated to be no greater than ***negative, moderate*** and ***short-term.***

Operational Phase

Once operational, the proposed Kilshane Phase 2 will be well screened and where visible by human receptors, the development will not detract notably from the prevailing robust industrial character of the

Kilshane site. Interactions between Landscape and Visual Impact and Human Health and Population are expected vary depending on the distance from Proposed Development and are anticipated to be no greater than ***negative, moderate*** and ***long-term.***

16.9.2 Biodiversity

Construction Phase

Site clearance, including the removal of vegetation, will have a negative impact on local biodiversity during the construction phase. However, these effects will be short-term. Additionally, perimeter hedgerows will be retained, and additional planting is proposed as part of the landscape plan, which will support the recovery and enhancement of local habitats. Interactions between Landscape and Visual Impact and Biodiversity during construction are anticipated to be ***negative, not significant*** and ***short-term.***

Operational Phase

The retention of areas of perimeter hedgerow vegetation and the maturing of the proposed landscaping measures including planting of new hedgerow, trees, woodland meadow mix and wildflowers within the site will be of relevance to the local biodiversity. Interactions between Landscape and Visual Impact and Biodiversity during operations are anticipated to be ***positive, not significant*** and ***long-term.***

16.9.3 Material Assets - Utilities

Operational Phase

During the operational phase, the Proposed Development will be served by a range of Sustainable Urban Drainage Systems (SuDS), which will also contribute to the wider landscape strategy for the Kilshane site. The integration of these SuDS features will enhance the site's ecological and visual character, creating a more complex and richer landscape and resulting in a ***positive, not significant*** and ***long-term*** interaction between Landscape and Visual Impact and Utilities.

16.9.4 Traffic & Transport

Construction Phase

During the construction of the Proposed Development, the increased construction stage traffic on the surrounding local and regional roads will further intensify the anthropogenic character of the wider landscape context, resulting in a ***negative, slight*** and ***short-term*** interaction between Landscape and Visual Impact and Traffic and Transport.

16.10 Archaeological, Architectural and Cultural Heritage, and its Interaction with:

There are no interactions or interrelationships between archaeology, cultural and architectural heritage and other aspects of the EIAR.

16.11 Traffic and Transportation, and its Interaction with:

16.11.1 Population and Human Health

Construction Phase

During the Construction Phase, traffic will be managed to minimise any impact through the use of a traffic management plan. The impact is considered to have a ***negative, not significant*** and ***temporary*** effect on the local population and human health. Traffic during construction phase will undertaken and managed

in accordance with the approved Construction Traffic Management Plan and in adherence to the mitigation measures outlined in this EIAR, thereby minimising disruption and ensuring public safety.

Operational Phase

During the Operational Phase, changes in traffic patterns are expected to lead to a ***neutral, not-significant, long-term*** effect on the population and human health. However, these effects are considered to be low in magnitude and not significant in terms of health outcomes. Furthermore, traffic management during this stage will be guided by the Mobility Management Plan, which will mitigate any adverse effects and promote sustainable transport solutions.

16.11.2 Biodiversity

Construction Phase

Species using habitats in close proximity to the development sites will experience a temporary to short-term increase in disturbance as a result of construction machinery and additional traffic on the road network. Such risks will be mitigated in accordance with the mitigation measures proposed within this EIAR. The interactions between traffic and biodiversity are expected to be ***negative, not significant*** and ***temporary*** to ***short-term***.

16.11.3 Land and Soils

Construction Phase

Material excavated during the Construction Phase will be transported by road for disposal at authorised and approved locations, as detailed in this EIAR. The movement of construction traffic will be managed in accordance with the Construction Traffic Management Plan to minimise disruption and environmental effects. The increase in traffic on the roads as result of soil removal is expected to generate a ***negative, not significant*** and ***short-term*** interaction between the two environmental factors.

16.11.4 Air Quality

Construction Phase

As outlined in section 16.6.5 of this chapter, 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. Additionally, the movement of materials by construction vehicles may have an impact on dust emissions if not appropriately mitigated. The traffic impacts of the Proposed Development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, it has been concluded that there is no potential for significant impacts from traffic on air quality. The implementation of the mitigation measures outlined in Chapters 8 and 13 will ensure any interactions between Air Quality and Traffic and transport are ***negative, not significant*** and ***short-term*** during the construction phase.

Operational Phase

During the Operational Phase, the development is expected to result in a minimal increase in traffic volumes, which will contribute to a ***negative, imperceptible*** and ***long-term*** effect on air quality. Nonetheless, this effect is anticipated to be ***not significant***, given the scale of the development and the mitigation measures proposed. These include the promotion of sustainable transport modes, such as walking, cycling, and public transport, as detailed in the Mobility Management Plan. The operational phase will also be subject to ongoing monitoring to ensure compliance with national air quality standards and climate objectives.

16.11.5 Noise and Vibration

Construction Phase

The traffic generated during the construction phase has the potential to impact on noise and vibration levels in the surrounding area. These effects are expected to be of short-term duration and will be carefully controlled and monitored in accordance with the mitigation measures outlined in this EIAR. Measures such as restricted working hours, use of low-noise machinery, and vibration monitoring will be implemented to minimise disturbance to nearby residents and sensitive receptors. During construction the interactions between Traffic and Transportation and Noise and Vibration will be ***negative, not significant*** and ***short-term.***

Operational Phase

During the operational phase, traffic associated with the development will result in a ***negative, imperceptible*** and ***long-term*** increase in ambient noise levels. However, this is expected to be not significant in EIA terms, given the projected traffic volumes and the nature of the surrounding environment. Noise levels will remain within acceptable thresholds, and the implementation of the Mobility Management Plan will support strategies to reduce reliance on private vehicles, thereby helping to limit any potential increase in noise and vibration over time.

16.11.6 Material Assets – Waste

Construction Phase

Excess material excavated during construction works will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan and interactions are expected to be no greater than ***negative, not significant*** and ***short-term.***

Operational Phase

There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase, however these movements will be imperceptible in the context of the overall traffic and transportation increase. Overall, during operations the predicted interactions will be ***neutral, not significant*** and ***long-term***.

16.12 Material Assets - Utilities, and its Interaction with:

16.12.1 Land, Soils and Geology

Construction Phase

There is a risk of pollution of groundwater by accidental spillage of foul effluent during connections being made to live sewers. This risk will be mitigated in accordance with Chapter 5 of this EIAR along with the implementation the CEMP and best practice construction measures. Residual interactions are deemed to be ***neutral, slight*** and ***short-term***.

16.12.2 Noise & Vibration

Construction Phase

Heavy machinery used for excavations to facilitate watermains, drainage and attenuation may impact on noise and vibration levels during construction. Both noise and vibration will be controlled and monitored

as set out in Chapter 10 of this EIAR with residual interactions anticipated to be no greater than ***negative, not significant*** and ***short-term***.

16.12.3 Waste & Waste Management

Construction Phase

Excess soil excavated during construction works to facilitate watermains, drainage and attenuation, including any potential contaminated soils, will be managed and disposed of in approved locations as provided for in this EIAR. Adherence to the submitted RWMP and to the mitigation measures outlined in this EIAR will ensure no negative interactions between utilities and waste occur. Interactions are anticipated to be ***neutral, not significant*** and ***short-term.***

16.12.4 Biodiversity

Construction Phase

There is a risk of pollution of groundwater and water courses by accidental spillage of foul effluent during connections being made to live sewers, which could affect local flora and fauna. This risk will be mitigated in accordance with the mitigation measures outlined in this EIAR and in the Construction Environmental Management Plan (CEMP) prepared by Waterman Moylan and included with this planning application. Residual interactions between Biodiversity and utilities are deemed to be ***neutral, not significant*** and ***short-term*** during construction.

16.13 Material Assets - Waste, and its Interaction with:

16.13.1 Human Health and Population

Construction Phase

Waste management practices have the potential to affect human health through exposure to improperly handled waste during construction and / or operation, which could result in littering and presence of vermin, with associated risks to human health. A carefully planned approach to waste management and adherence to the project specific RWMP, along with the mitigation measures in Chapter 4 (Human Health & Population) and Chapter 15, will minimise risks associated with odour, pests, and contamination, thereby protecting the health and well-being of workers at the Proposed Development and the local population. Potential effects on population and human health are addressed in Chapter 4. The effects are expected to be ***neutral, imperceptible*** and ***long-term.***

16.13.2 Land, Soils and Geology

Construction Phase

During the construction phase, there will be soil, stones and clay excavated to facilitate site clearance, construction of new building foundations and installation of services. The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 63,856 of material (comprising 10,200m^3 of topsoil and 53,656m^3 of other material) will need to be excavated. It is currently envisaged that none of this excavated material will be reused on site, meaning the full volume will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal. When material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.

The management of contaminated soil, if encountered, will be undertaken in accordance with the Land and Soils chapter and the RWMP. Proper classification and handling of soil waste will prevent degradation of land quality and avoid cross-contamination with clean materials. Potential effects on land and soils are addressed in Chapter 7. Adherence to the mitigation measures in Chapter 7 (Land, Soils & Geology),

Chapter 15 and the requirements of the RWMP (Appendix 15.1), will ensure the effect is ***neutral, imperceptible*** and ***short-term***.

16.13.3 Hydrology and Hydrogeology

Construction Phase

Improper storage or disposal of waste, particularly hazardous substances, has the potential to impact surface water and groundwater quality during the construction phase. The RWMP includes provisions for bunded storage of hazardous materials and protocols for managing contaminated soil. These measures will mitigate the risk of leachate or runoff entering watercourses and protect the hydrological environment. Potential effects on hydrology and hydrogeology are addressed in Chapter 6 and, following the implementation of mitigation measures, are expected to be ***neutral, imperceptible*** and ***short-term***.

16.13.4 Biodiversity

Construction Phase

The potential impacts on biodiversity in relation to the generation of waste during the construction phase are that the incorrect management of waste could result in littering, pollution issues or vermin in areas affected. Adherence to the mitigation measures set out in Chapter 15 (Waste Management), and in Chapter 7 (Biodiversity) will ensure the associated effect is ***neutral, imperceptible*** and ***short-term***.

Operational Phase

The potential impacts on biodiversity in relation to the generation of waste during the operational phase are that the incorrect management of waste could result in littering, pollution issues or vermin in areas affected. Adherence to the mitigation measures set out in Chapter 15 (Waste Management), and in Chapter 7 (Biodiversity) will ensure the associated effect is ***neutral, imperceptible*** and ***long-term***.

16.13.5 Climate

Construction Phase

Waste management contributes to greenhouse gas (GHG) emissions, particularly through landfill disposal and transport. The RWMP prioritises reuse, recycling, and recovery of materials, which will reduce the volume of waste sent to landfill and associated emissions. The direct and indirect effects of the Proposed Development on climate, such as GHG are addressed in Chapter 9, and following implementation of mitigation measures, are expected to be ***neutral, imperceptible*** and ***long-term***.

16.13.6 Traffic and Transport

Construction Phase

Local traffic and transport will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction of the Proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. Provided the mitigation measures detailed in Chapter 13 and Chapter 15 are adhered to, the predicted interactions will be no greater than ***negative, not significant*** and ***short-term***.

Operational Phase

There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase, but these movements will be imperceptible in the context of the overall traffic and transportation increase. Overall, during operations the predicted interactions will be ***neutral, not significant*** and ***long-term***.

16.14 Summary

In summary, the interactions between the environmental factors and impacts discussed in this EIAR have been assessed and the majority of interactions are neutral or negative. Negative interactions are generally associated with the construction phase and will be short term in nature. There are some long-term positive interactions associated with the operation of the Proposed Development.

The reasoning behind the conclusion that certain interactions are considered to have a positive, neutral or negative effect is outlined in this Chapter. A summary of the potential interactions is presented in Table 16.1 below

16.15 Table of Interactions

Table 16.1 Summary of Interrelationships between the Aspects

	Population & Human Health		Land, Soils & Geology		Hydrology & Hydrogeology		Biodiversity		Air Quality & Climate		Noise & Vibration		Landscape & Visual Impact		Archaeological Architectural & Cultural Heritage		Material Assets (including Transport & Waste)	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Population & Human Health			o	X	o	o	X	X	–	–	–	o	–	O / -	X	X	o	o /+
Land, Soils & Geology					–	o	–	X	–	X	X	X	X	X	X	X	o	X
Hydrology & Hydrogeology							–	o	X	o	X	X	X	X	X	X	o	o
Biodiversity									–	o	–	o	–	+	X	X	X	X
Air Quality & Climate											X	X	X	X	X	X	–	–
Noise & Vibration													X	X	X	X	–	–
Landscape & Visual Impact															X	X	–	+ / -
Archaeological Architectural and Cultural Heritage																	X	X
Material Assets (including Transport & Waste)																		

Con.	Construction Phase
Op.	Operational Phase
X	No Interaction

+	Positive Interaction
o	Neutral Interaction
–	Negative Interaction