REPORT

Environmental Report

Ballycummin 110kv Substation, Raheen, Co. Limerick

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AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Signature		
Name	Natalie Machado	Sarah Robertson
Title	Senior Environmental Consultant	Principal Consultant
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1. EXECUTIVE SUMMARY

1.1 Description of Proposed Development

AWN Consulting Limited (AWN) has prepared this Environmental Report (ER) which accompanies the Strategic Infrastructure Development (SID) planning application to be submitted by the Electricity Supply Board (ESB) (the Applicant) to An Coimisiún Pleanála. The Proposed Development is being advanced by ESB Networks (ESBN) as a high-priority project to address load and supply constraints in the Greater Limerick Area. These constraints have arisen due to the existing Limerick 110/38 kV substation having reached full load capacity. The new substation is required to relieve the existing facility and to provide additional capacity to meet demand in the Greater Limerick Area, including the Raheen Business Park. The substation is proposed to be located in Ballycummin on lands within the Raheen Business Park, County Limerick.

The site is situated on Roches Avenue, immediately adjacent to the Eli Lilly facility, within an area primarily occupied by industrial and commercial uses. The development will comprise an indoor GIS double busbar C-type 110 kV transmission station containing No. 2 - 63 MVA 110/38 kV transformers and No. 2 - 15 MVA 38 kV/MV transformers. All 110 kV equipment will be designed and constructed in accordance with EirGrid standards.

Associated works will also be undertaken to facilitate connection of the new substation to the transmission network. These works will involve modifications to the existing 110 kV overhead line, including the replacement of some existing structures and the underground cabling of certain sections of the line. The new station will be looped into the existing Limerick–Moneteen 110 kV transmission circuit.

The Proposed Development constitutes the provision of a new 110 /38 / 20 kV Gas Insulated Switchgear (GIS) electrical substation and will include the following elements:

1. Removal of four existing 110 kV Overhead Line timber pole sets (c. 15 m in height) and c.800 m of Overhead Line conductor;
2. Relocation of existing Interface Transformer;
3. Construction of:

i. A new substation compound (c. 5,950 sq.m.) with a 2.6 m high palisade fencing;

ii. A new 110 kV GIS building with eight 110 kV bays (c. 700 sq.m.; 12 m in height);

iii. A new 38 / 20 kV GIS building with fourteen 38 kV bays and eighteen MV (20 kV) bays (c. 235 sq.m.; 7 m in height);

iv. Two bunded 110 / 38 kV power transformers (c. 5 m high) with associated electrical equipment;

v. Two bunded 38 / 20 kV power transformers (c. 5 m high) with associated electrical equipment;

vi. Three Arc Suppression Coils (c. 4 m high) with associated electrical equipment;

vii. Two new 110 kV double circuit overhead (OHL) line / cable interface end masts (c. 17m in height);

viii. One new 110 kV double circuit overhead (OHL) line angle mast (c. 17 m in height);

ix. One temporary 110 kV Overhead Line timber pole set (c. 16 m in height);

x. Temporary diversion of the existing 110 kV overhead line to the temporary timber pole set (c. 320 m of OHL conductor);

xi. Diversion of the existing 110 kV overhead line to the new end masts (c. 510 m of OHL conductor);

xii. 110 kV underground cabling between the 110 kV GIS building and the new line / cable interface end masts;

xiii. Associated and ancillary outdoor electrical equipment and other apparatus, including installation of underground cables and ducts;

4. Site development works including provision of access roads, car parking area, lighting, telecommunications, fencing, landscaping, site services including drainage and all other ancillary works.

1.2 Biodiversity

This section was written by Moore Group and provides an assessment of the effects of the Proposed Development on the ecological environment, i.e., biodiversity, flora and fauna. The conclusions of this section were supported by an ecological survey undertaken at the project site in July 2025 and by an Appropriate Assessment Screening Report (Moore Group, 2025) which has been included with this Planning Application.

The lands on which the proposed substation are to be constructed, comprise an area of hardstanding currently used for the storage of construction materials for the Eli Lilly development in progress, as well as an area of grassland adjacent to the northeast. The footprints of the proposed re-sited cable towers comprise hard standing at the western cable tower, and a section of recently deposited earth mounding at the eastern cable tower. The land between these pylons includes a fenced and signposted area of grassland where translocated Meadow Barley has been propagated (Meadow Barley translocation area (MBTA)). Re-strung electrical wires will cross this area, as they will the section between the western cable tower and an existing cable tower in grassland to the southwest, which will cross the R526 road and a number of hedgerows .

There are no predicted emissions from dust or noise to air or water that could have a significant effect on the European sites located in the potential Zone of Influence. There is also a lack of connectivity for the Proposed Development with Lower River Shannon SAC (Site Code 002165), and the River Shannon and River Fergus Estuaries SPA (Site Code 004077).

The implementation of mitigation measures outlined below (Appendix B) will ensure that no significant impacts arise from the Proposed Development during construction. The predicted residual impacts on biodiversity during the construction phase are deemed to be ***short-term, not significant*** and ***negative***.

The implementation of mitigation measures highlighted below (Appendix B) will ensure that the predicted residual impacts on biodiversity during the operational phase will be ***long-term, imperceptible*** and ***positive***.

1.3 Land, Soils, Geology, Hydrogeology and Hydrology

This section evaluates the effects, if any, which the Proposed Development will have on Land, Soils, Geology, Hydrogeology and Hydrology as defined in the Environmental Protection Agency (EPA) 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2017). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this assessment and classification of environmental effects.

The Proposed Development site lies within the Shannon Estuary South Catchment (Hydrometric Area 24) and the Ballynaclogh sub-catchment. The Barnakyle River is located approximately 940 m to the south of the site and discharges into the Maigue Estuary (European Code IE_SH_060_0700), and subsequently into the Upper Shannon Estuary (European Code IE_SH_060_0800).

The closest European Sites to the Proposed Development are the Lower River Shannon SAC (site code: 002165) approx. 2.37 km north-east and the River Shannon and River Fergus Estuaries SPA (site code: 004077), located approx. 2.63 km to the north-east. Due to the site separation distances and the absence of any waterbodies within the Proposed Development site, there is no direct hydrological or hydrogeological link between the development site and the above-mentioned European sites.
During operations, surface water will be managed using SuDS measures that replicate natural drainage and greenfield conditions. Water will discharge into a soakaway system with 189 m^3 capacity, designed to handle storm flows and remove suspended solids via an isolator row. Runoff from the new access road will be collected through gullies and directed into the soakaway for infiltration. An outfall pipe will allow excess water to exit the site during heavy rainfall. All runoff will pass through a catchpit to capture fine sediments before entering the soakaway.

The implementation of mitigation measures outlined in Appendix B will ensure that no significant impacts arise from the Proposed Development during construction. The predicted residual impacts on Land, Soils, Geology, Hydrogeology and Hydrology during the construction phase are deemed to be ***short-term, imperceptible and neutral***. Following the Transport Infrastructure Irelad (TII) criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

The implementation of mitigation measures highlighted below (Appendix B) will ensure that the predicted residual impacts on Land, Soils, Geology, Hydrogeology and Hydrology during the operational phase will be ***long-term, imperceptible and neutral***. Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

1.4 Air Quality and Climate

This section assesses and evaluates the potential impacts of the Proposed Development on the surrounding environment with respect to air emissions and climate change. The potential impacts and the outcome of the assessment are summarised below.

Due to the nature of the Proposed Development, the greatest potential for air quality and climate change impacts will be related to its construction phase. During construction, the greatest potential for air quality impacts is from fugitive dust emissions impacting nearby sensitive receptors, and from the use of construction plant and construction traffic, which emit air pollutants.

Any potential dust impacts can be mitigated through the implementation of the submitted CEMP (AWN, 2025a) and the implementation of the mitigation measures outlined in Appendix B. Dust impacts will be ***negative, short-term*** and ***imperceptible*** to the nearest sensitive receptors once the mitigation measures are implemented. Climate effects will also be ***negative, short-term*** and ***imperceptible***, during construction.

Once works are completed dust levels will return to baseline conditions, the operational emissions will be negligible and associated with the infrequent operation of the proposed back-up generator and minor traffic emissions from approximately 6 vehicle movements a week. Emissions from traffic have been scoped out of a detailed air quality assessment as the Proposed Development is not predicted to significantly change the traffic on the local road network.

Despite the minor operational emissions associated with the Proposed Development, the construction of substations including the Proposed Development will facilitate the access and implementation of decarbonized electricity and achievement of key ESB Networks' Net Zero objectives of and Ireland's climate related policies and targets.

Overall, the operational stage impact to air quality and climate is considered ***long-term, neutral*** to ***positive,*** and ***imperceptible***.

No significant impacts to air quality and climate are predicted during either the construction or operational phases of the Proposed Development.

1.5 Noise and Vibration

This section assesses and evaluates the potential impacts of the Proposed Development on the surrounding environment with respect to noise and vibration. The potential impacts and the outcome of the assessment are summarised below.

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with with *ISO 1996-1: 2016: Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic Quantities and assessment Procedures*.

In terms of operational noise impacts, proprietary noise calculation software was used for the purposes of this impact assessment. The selected software, DGMR iNoise Enterprise, calculates noise levels in accordance with ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors*, (ISO, 2024). Noise data for the proposed external transformers has been supplied by the project team and has been input into the 3D noise model.

Based on the survey data and based on results of the noise model, the noise impact assessment for Proposed Development concluded that:

- During the construction phase, works will comprise excavation for underground cables, mast construction and construction of substation buildings. The vast majority of works will take place within the Raheen Business Park in areas that are located far from residential sensitive receivers, in an industrial and relatively noisy environment. Noise and vibration impacts associated with construction works are predicted not to cause significant impacts.
- During the operational phase, noise modelling of proposed external noise sources indicates that the resultant noise level experienced at the nearest noise sensitive locations is negligible and there is not risk of adverse noise impacts as a result of this operation. Traffic to and from the development is expected to be limited and far below a magnitude which would cause even a marginal increase in noise level to the surroundings.

1.6 Archaeological & Cultural Heritage

This section was written by CRDS and provides an assessment of the effects of the Proposed Development on archaeology and cultural heritage. The conclusions of this section were supported by a Heritage Walkover Survey undertaken at the project site in July 2025.

The majority of the Proposed Development is sited on previously developed land. There are two areas of greenfield that have not been subjected to development in the recent past, in the west and north.

There are no recorded archaeological monuments or architectural heritage within the proposed redline area or in the immediate vicinity of Proposed Development boundary. A recorded Fulacht fiadh (SMR No. LI13-234) is located within the Eli Lilly site, however this archaeological monument is not located within the Proposed Development boundary, or on its immediate vicinity. Therefore, the Fulacht fiadh will not be impacted directly or indirectly by Proposed Development. A walled laneway depicted on the first and subsequent editions of the Ordnance Survey maps survives in the eastern portion of the Proposed Development boundary but will not be impacted by the Proposed Development works.

The site has been subjected to archaeological investigations, which led to the identification of a number of sites in the vicinity of the Proposed Development, and their subsequent excavation (Excavation Nos. 1999:483-484, 2018:049, 22R0152 and 22E0464). Given the number of archaeological sites found during these investigations, there is the potential for further features to be encountered during ground disturbance of greenfield areas. Should such features occur, they will be negatively impacted on by construction works.

Once proposed mitigation is implemented, the impact on archaeological, architectural and cultural heritage will be ***neutral***, ***not significant*** and ***permanent***, with no residual effects during the construction phase relating to archaeological, architectural and cultural heritage.

No impacts on archaeological, architectural and cultural heritage are expected as a result of the operational phase of the Proposed Development. Therefore, no mitigation measures are deemed required.

1.7 Landscape and Visual

This section assesses and evaluates the potential impacts of the Proposed Development on the surrounding environment with respect to landscape and visual impacts. The assessment of the potential landscape and visual impacts associated with the Proposed Development are based on a desktop study in consultation with the Limerick County Development Plan 2022-2028. The potential impacts and the outcome of the assessment are summarised below.

The closest sensitive receptors to impacts are the residential dwellings located along the R526 Road to the northwest. However, the intervening Eli Lilly site benefits from established boundary treatments along its northwestern boundary, which provide visual screening to proposed works.

To the northeast, the installation of the construction compound and the construction of the proposed substation will introduce a noticeable visual change, particularly for pedestrians and road users along Roches Avenue. This portion of the site is directly adjacent to the road and lacks substantial screening, making it more visually exposed.

The implementation of the submitted Landscape Plan (Macro Works, 2025a) and adherence to the mitigation measures recommended in the submitted CEMP (AWN 2025a) and in Appendix B to this report will ensure that the residual impacts on landscape and visual are no greater than ***negative, not significant*** and ***short-term*** during construction.

It is anticipated that the landscape and visual impacts during operations will be effectively managed through the implementation of the designed landscape measures with a ***negative, imperceptible,*** and ***long-term*** impact. No further mitigation measures are required for landscape and visual during the operational phase of the Proposed Development.

1.8 Population and Human Health

This Section of the ER has been prepared in order to assess the likely significant effects on human health population in respect of the Proposed Development. The likely significant impacts on Human Health and Population in regard to soils, geology and hydrogeology, water, air quality, noise and vibration, landscape and traffic are addressed in detail within the following ER sections:

- Section 5 - LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY
- Section 6 - AIR QUALITY AND CLIMATE
- Section 7 - NOISE AND VIBRATION
- Section 9 - LANDSCAPE & VISUAL
- Section 11 - MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

The Proposed Development site is located in the Local Authority Area of Limerick City and County Council (LCCC), and in the electoral division (ED) of Ballycummin (ED ID: 21051). The area selected for the assessment of the impact on human health has been defined as the ED containing the Proposed Development site and those within 1 km of the Proposed Development site. The EDs which will be included alongside Ballycummin are Patrickswell (ED ID: 21067), and Roxborough (ED ID: 21068), all of which are also located within the LCCC Local Authority Area. The assessment has concluded that the population in the study area exhibits a relatively lower sensitivity to change and having a 'Low' population sensitivity.

Following the implementation of the recommended mitigation measures outlined in the CEMP and in the above-mentioned Sections, any residual impacts on human health and local populations during the construction phase of the Proposed Development are anticipated to be ***imperceptible, negative,*** and ***short-term.***

Due to the nature of the proposed development and the absence of significant noise, air, land, or water emissions, as well as minimal additional operational traffic, it is considered that no adverse impacts will occur with respect to human health and population without the implementation of mitigation measures. Overall, the effect is expected to be imperceptible***, neutral,*** and ***long-term*** during operational phase.

1.9 Material Assets (Roads and Traffic, Waste management and Utilities)

This Section of the ER has been prepared in order to assess the likely significant effects on material assets including roads and traffic, waste management, and utilities in respect of the Proposed Development.

The assessment of the impacts of the Proposed Development arising from roads and traffic, the use of material assets, and the generation of waste materials, was carried out taking into account the information provided by ESB on the Proposed Development and based on the methodology specified in relevant guidance documents.

The implementation of the mitigation measures outlined in the submitted CEMP, RWMP (AWN 2025a, 2025b) and in Appendix B will ensure that the residual impacts on material assets including roads and traffic, waste, and utilities are no greater than ***negative, imperceptible*** and ***short-term*** during construction.

Once operational, the proposed substation will play a key role in strengthening energy security across the Raheen area. It will also assist in alleviating loading pressures and supply constraints on the Limerick 110/38 kV medium-voltage network, resulting in a positive impact on the region's electrical infrastructure.

Overall, it is anticipated that the Proposed Development will have a ***neutral, imperceptible and long-term*** impact on the surface water infrastructure, foul infrastructure and on water supply and will have a ***positive, moderate and long-term*** impact on the electrical infrastructure. No mitigation measures are deemed necessary during the operational phase of the Proposed Development in respect of material assets.

2. INTRODUCTION

On behalf of the Electricity Supply Board (ESB) (the Applicant), AWN Consulting Limited (AWN) has prepared the following Environmental Report (ER) to accompany a Strategic Infrastructure Development (SID) planning application to be submitted to An Coimisiún Pleanála. The Proposed Development will be located within the Raheen Business Park, Ballycummin, Limerick.

The Proposed Development constitutes the provision of a new 110 /38 / 20 kV Gas Insulated Switchgear (GIS) electrical substation and will include the following elements:

1. Removal of four existing 110 kV Overhead Line timber pole sets (c. 15 m in height) and c.800 m of Overhead Line conductor;
2. Relocation of existing Interface Transformer;
3. Construction of:

iv. A new substation compound (c. 5,950 sq.m.) with a 2.6 m high palisade fencing;

v. A new 110 kV GIS building with eight 110 kV bays (c. 700 sq.m.; 12 m in height);

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vii. Three Arc Suppression Coils (c. 4 m high) with associated electrical equipment;

viii. Two new 110 kV double circuit overhead (OHL) line / cable interface end masts (c. 17m in height);

ix. One new 110 kV double circuit overhead (OHL) line angle mast (c. 17 m in height);

x. One temporary 110 kV Overhead Line timber pole set (c. 16 m in height);

xi. Temporary diversion of the existing 110 kV overhead line to the temporary timber pole set (c. 320 m of OHL conductor);

xii. Diversion of the existing 110 kV overhead line to the new end masts (c. 510 m of OHL conductor);

xiii. 110 kV underground cabling between the 110 kV GIS building and the new line / cable interface end masts;

xiv. Associated and ancillary outdoor electrical equipment and other apparatus, including installation of underground cables;

4. Site development works including provision of access roads, car parking area, lighting, telecommunications, fencing, landscaping, site services including drainage and all other ancillary works.

The Proposed Development redline boundary comprises a total 5.52 ha, and extends across the Eli Lilly site, the Roches Avenue, the Regeneron site, the Stryker Orthopaedics site, the R523 Road, across a residential property and also across undeveloped green areas to the west. The Proposed Development redline boundary and overall site layout are shown in Figure 1 and Figure 2.

Figure 1 Proposed Development Redline Boundary

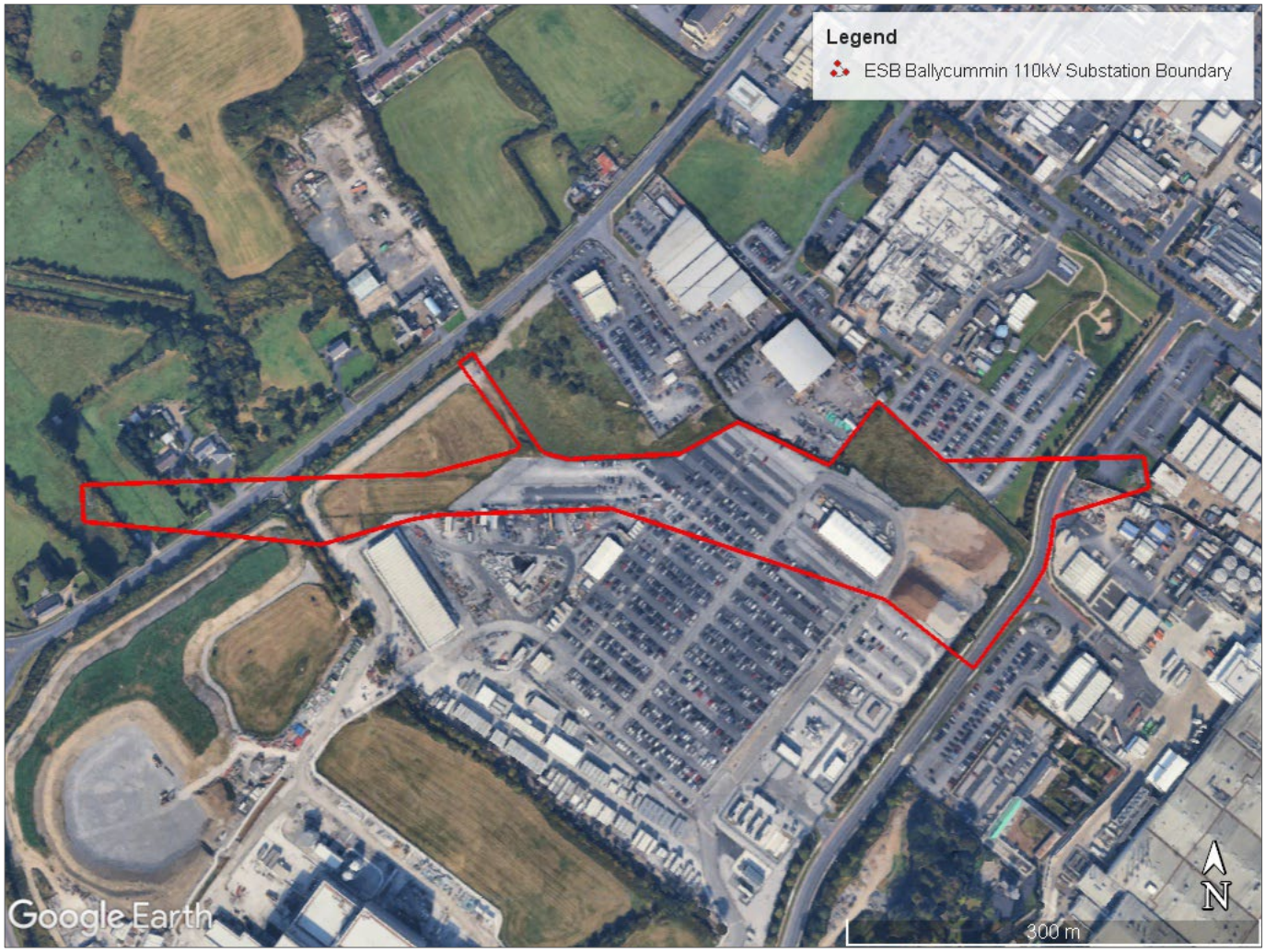
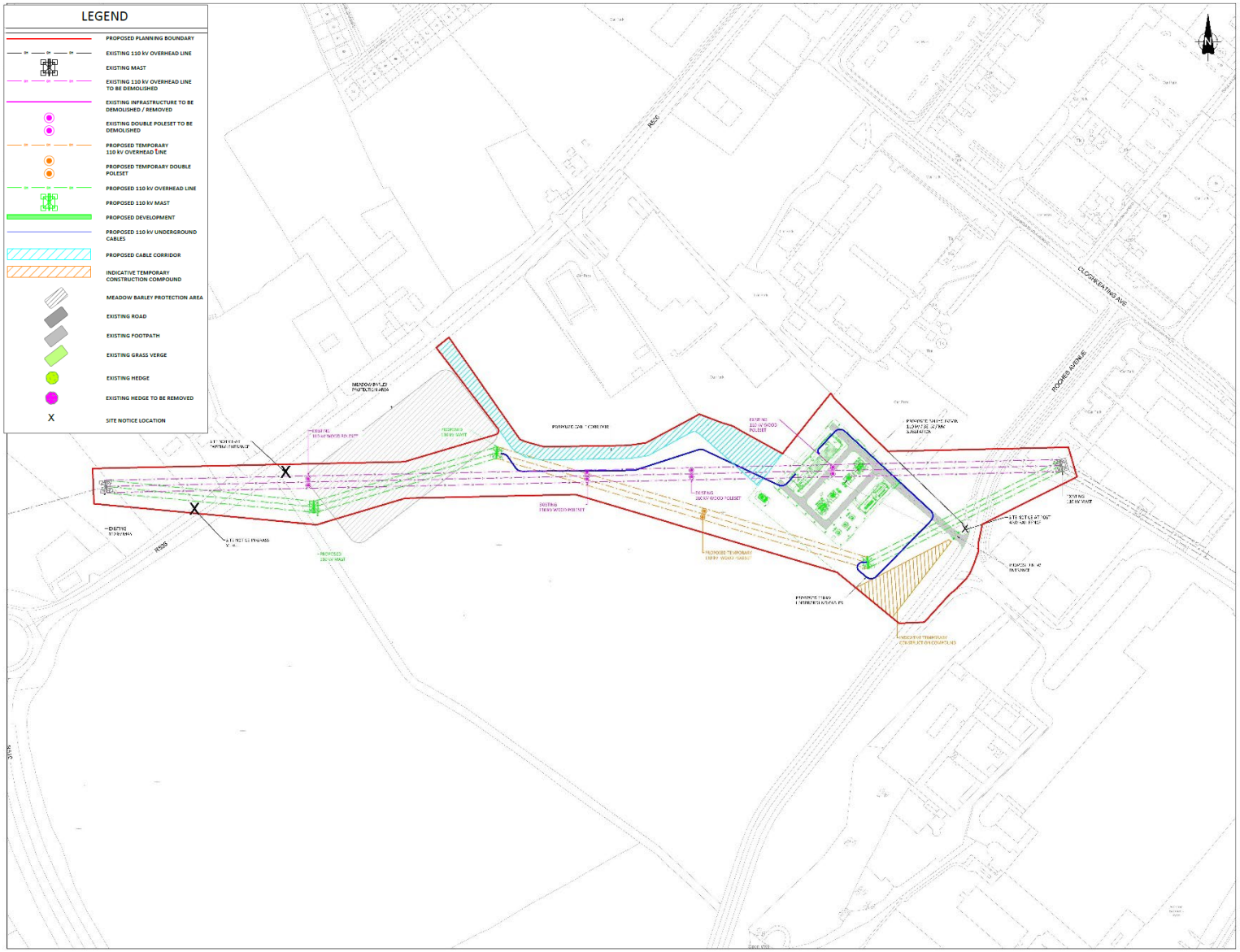


Figure 2 Overall Project Layout[1]



[1] Drawing no. PE492-184-067-002-001 included with this application

2.1 Report Structure

This assessment has been undertaken to assess the potential impacts of the proposed 110kV substation on the existing environment. As such the scope of the assessment has focused on the attributes of the environment which could be impacted by the Proposed Development. For each of these environmental attributes, specialists have considered the baseline conditions, any likely impacts (neutral, positive and negative) and required mitigation measures.

The following environmental attributes have been considered under this report:

- Biodiversity
- Land, Soils, Geology, Hydrology and Hydrogeology
- Air Quality & Climate
- Noise & Vibration
- Archaeological & Cultural Heritage
- Landscape & Visual
- Population and Human Health
- Material Assets (Roads and Traffic, Waste management and Utilities)

The format of this report has generally followed Guidelines for Environmental Impact Assessment Reports (EIAR) where relevant (draft EPA Guidelines 2017).

An Appropriate Assessment (AA) Screening have also been carried out by Moore Group (2025) to assess the potential of the proposal to affect the integrity of the Natura 2000 network. The findings are provided in an AA Screening Report which is included as a stand-alone report with this SID application. The submitted AA screening concludes that there will be no impacts to any European Sites as result of the Proposed Development.

2.2 Environmental Report Team

The study team engaged to prepare this report are all appropriately qualified, experienced and expert in their respective fields. The individual specialists are as listed below.

Table 1 Roles and Responsibilities in the Project Team

Role	Contributor
Planning, Architectural Design, Structural and Civil Engineering	ESB
Environmental Consultant	AWN Consulting
Section Title	**Consultant**
Description of Proposed Development	Natalie Machado (AWN), Liam McManus and Aarabhi Kadsur (ESB)
Biodiversity	Ger O 'Donohoe (Moore Group), David Daly (ESB) (review)
Land, Soils, Geology, Hydrogeology and Hydrology	Natalie Machado and Sarah Robertson (AWN)
Air Quality and Climate	Natalie Machado and Sarah Robertson (AWN)
Noise and Vibration	Leo Willians (AWN)
Archaeological & Cultural Heritage	Stephen Mandel (CRDS)
Landscape & Visual	Natalie Machado, Sarah Robertson (AWN)
Population and Human Health	Natalie Machado, Sarah Robertson (AWN)
Material Assets (Roads and Traffic, Waste management and Utilities)	Natalie Machado, Chonaill Bradley (AWN)

Sarah Robertson is a Principal Consultant in AWN Consulting with responsibility for IED licence applications, GMM and DAFM ABP certificates. She also provides EIAR management and specialist input

to EIAR chapters. Sarah has over ten years experience working in the environmental field in impact assessment, EIAR management, environmental masterplans, urban planning, waste management, specialist ecological surveys, AA screening and Natura Impact Statements. Sarah holds a BA. Hons (mod Science), MSc. and a Diploma in Environmental Engineering, and has worked in Ireland, the UK, and the USA.

Natalie Machado 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.

Leo Williams is a Senior Acoustic Consultant graduated from TCD with a BA, BAI (Mechanical and Manufacturing Engineering) and an MAI (Mechanical and Manufacturing Engineering). Leo is a Member of the Institute of Acoustics and has extensive experience in environmental noise impact assessment, in particular industrial/manufacturing and renewable energy noise sources. He has experience in room and building acoustics modelling and assessment. He has completed the IOA Diploma in Acoustics and Noise Control and is a registered sound insulation tester under the Sound Insulation Testing Register, Ireland (SITRI).

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

Ger O'Donohoe has over 20 years experience as an environmental consultant with particular experience in the management and planning of Environmental Impact Assessments. He graduated from GMIT in 1993 with a B.Sc. in Applied Aquatic Sciences and subsequently worked in environmental consultancy while completing an M.Sc. in Environmental Sciences, graduating from Trinity College, Dublin in 1999. He joined Moore Group in 2002. Ger's primary role in Moore Group is the management and compilation of Environmental Impact Statements and undertaking Ecological Impact Assessments of the terrestrial and aquatic environments of any particular development. Ger has excellent knowledge of Environmental Legislation, Planning and Policy. He has extensive experience in freshwater and marine ecology and in terrestrial habitat surveying and mapping. In addition to freshwater and marine ecology Ger carried bat surveys, mammal surveys and specialises in Visual Impact Assessment (VIA).

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

Janette McDonald, Planning and Consenting Team Lead, Engineering and Major Projects, ESB. Janette has over 14 years of experience in environmental assessment and EIA coordination for infrastructure projects of all scales. She holds an MSc in Water Resource Management from Queens University Belfast and BSc in Environmental Science for the University of Limerick and is an Associated Member of the Institute of Sustainability and Environmental Professionals (aISEP).

Aarabhi Kadsur, Environmental Engineer, Engineering and Major Projects, ESB. Aarabhi has over four years' experience in Environmental assessment and environmental co-ordination for thermal energy and

batteries. She holds a BEng in Chemical Engineering and a MEngSc in Water, Waste and Environmental Engineering from University College Dublin (UCD) and a member of Engineers Ireland.

Liam McManus, Civil Planning Design Specialist, Engineering and Major Projects ESB. Liam has over 10 years' experience in ESB working as a designer on various planning projects from onshore Wind Farms to 220 kV Substations. He holds a degree in Civil, Structural and Environmental Engineering from Trinity College Dublin.

David Daly (review), Senior Ecologist, Engineering and Major Projects, ESB. David Daly has over six years' professional experience in ecological consultancy. He holds a B.Sc. in Ecology from University College Cork, and obtained a distinction in M.Sc. in Species Identification and Survey Skills from the University of Reading. His experience primarily includes the preparation of Ecological Impact Assessments, Biodiversity Chapters of Environmental Impact Assessment Reports (EIAR) , Appropriate Assessment (AA) Screening reports and Natura Impact Statements (NIS) for a range of public and private projects across Ireland, largely renewable energy projects. David is a terrestrial ecologist with experience in habitat, botanical, ornithological, bat and mammal surveys and assessments in both Ireland and the UK.

2.3 ASSESSMENT OF ENVIRONMENTAL IMPACT

In the environmental report the quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022) this criterion is duplicated in Table 2

Table 2 Schedule of Impacts following EPA Guidelines

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Characteristic	Term	Description
Describing the Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Type of Effects	Indirect Effects	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out
	`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Development Site

The Proposed Development site area comprises a total 5.45 ha. and is situated within an area predominantly characterised by commercial and industrial land use, forming part of the wider Raheen Business Park. The surrounding environment has been substantially modified through existing and ongoing development, with established infrastructure and a connected public road network. The area designated to the proposed substation mostly comprises a mix of grassland and a temporary construction compound. This included construction-related parking, which is being utilised to support ongoing construction within the adjacent Eli Lilly site (permitted developments of LCC Planning references 22/190 (as amended) and 24/61160).

The site is located within the IDA Raheen Business Park on the outskirts of Limerick City, approximately 5.2 km southeast of the city centre and around 18.4 km southeast of Shannon Airport. It is predominantly surrounded by Eli Lilly lands, with Regeneron lands to the east and a mix of stand-alone residential properties and undeveloped areas to the west. The site crosses both Roches Avenue to the east and the R526 regional road to the west.

The site is relatively flat with a gentle slope Northwest to Southeast. The level at the centre of the site is approx. 23.80 mAOD. Site levels range from approx. 24.40 mAOD at the Northwestern boundary to 3.30 mAOD at the Southeastern side.

The nearest waterbody to the Proposed Development is the Barnakyle River, located approximately 940 m to the south. The Barnakyle River flows west into the Maigue Estuary, and subsequently into the Upper Shannon Estuary.

The nearest sensitive receptors to the Proposed Development site are the dwellings located immediately adjacent to the site to its western portion as shown in Figure 12 and included in Section 7.5.1. The closest densely populated residential area to the Proposed Development is located c.530m to the northeast of the site. The closest hotel to the Proposed Development is the Great National South Court Hotel located c. 300m northwest. The closest hospital is the Blackrock Health Limerick Clinic c. 450m to the northwest. The closest school is the St. Nessan's National School c. 690m northwest and the closest childcare is Care Bears Day Care Centre c. 650m southeast.

There are no designated sensitive receptors in the vicinity of the Proposed Development in relation to soil, geology, groundwater, or hydrogeology. There are no wetlands, significant riparian areas, river mouths, coastal zones, marine environment, mountain, forest areas or nature reserves and parks within the study area. No European Sites or Natural Heritage Areas (NHAs) occur at or in the vicinity of the project. The nearest European Sites to the Proposed Development are the Lower River Shannon SAC, and the River Shannon and River Fergus Estuaries SPA located c. 2.5km and 3km north of the nearest point of the proposed substation. There is no direct hydrological connection between Proposed Development and downstream protection areas.

According to the Flood Risk Assessment prepared for the Proposed Development (ESB, 2025b) which is submitted with this application, the development site is fully located within Flood Zone C and is not at risk of flooding for any of the assessed flood types including fluvial, coastal, pluvial and groundwater.

There are no recorded archaeological monuments or architectural heritage within the proposed redline area or in the immediate vicinity of Proposed Development boundary. A recorded Fulacht fiadh (SMR No. LI13-234) is located within the Eli Lilly site, however this archaeological monument is not located within the Proposed Development boundary, or on its immediate vicinity. Therefore, the Fulacht fiadh will not be impacted directly or indirectly by Proposed Development. Further assessment on archaeological and cultural heritage is included in Section 8 ARCHAEOLOGICAL & CULTURAL HERITAGE of this ER.

Further detail on the specifics aspects of the existing baseline is assessed within the following sections of this report:

- Section 4 - BIODIVERSITY
- Section 5 - LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY
- Section 7 - NOISE AND VIBRATION
- Section 8 - ARCHAEOLOGICAL & CULTURAL HERITAGE
- Section 9 - LANDSCAPE & VISUAL
- Section 10 - POPULATION AND HUMAN HEALTH
- Section 11 - MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

3.2 Characteristics of the Proposed Development

The Proposed Development constitutes the provision of a new 110 / 38 / 20 kV Gas Insulated Switchgear (GIS) electrical substation. The site will consist of several key elements.

Firstly, it will involve the removal of four existing 110 kV overhead line timber pole sets, each approximately 15 metres in height, along with around 800 metres of overhead line conductor.

Secondly, the construction of a new substation compound covering approximately 5,950 square metres, enclosed by a 2.6-metre-high palisade fence. Within this compound, a new 110 kV GIS building will be constructed, featuring eight 110 kV bays and occupying roughly 700 square metres with a height of 12 metres. Additionally, a separate 38 / 20 kV GIS building will be built, containing fourteen 38 kV bays and eighteen medium voltage (20 kV) bays, covering approximately 235 square metres and standing 7 metres tall.

The Proposed Development will also include the installation of two 110 / 38 kV power transformers housed in transformer bays approximately 5 metres high, along with associated electrical equipment. Similarly, two 38 / 20 kV power transformers will be installed in 5-metre-high bays, and three Arc Suppression Coil transformers will be placed in 4-metre-high bays, each with their respective electrical apparatus.

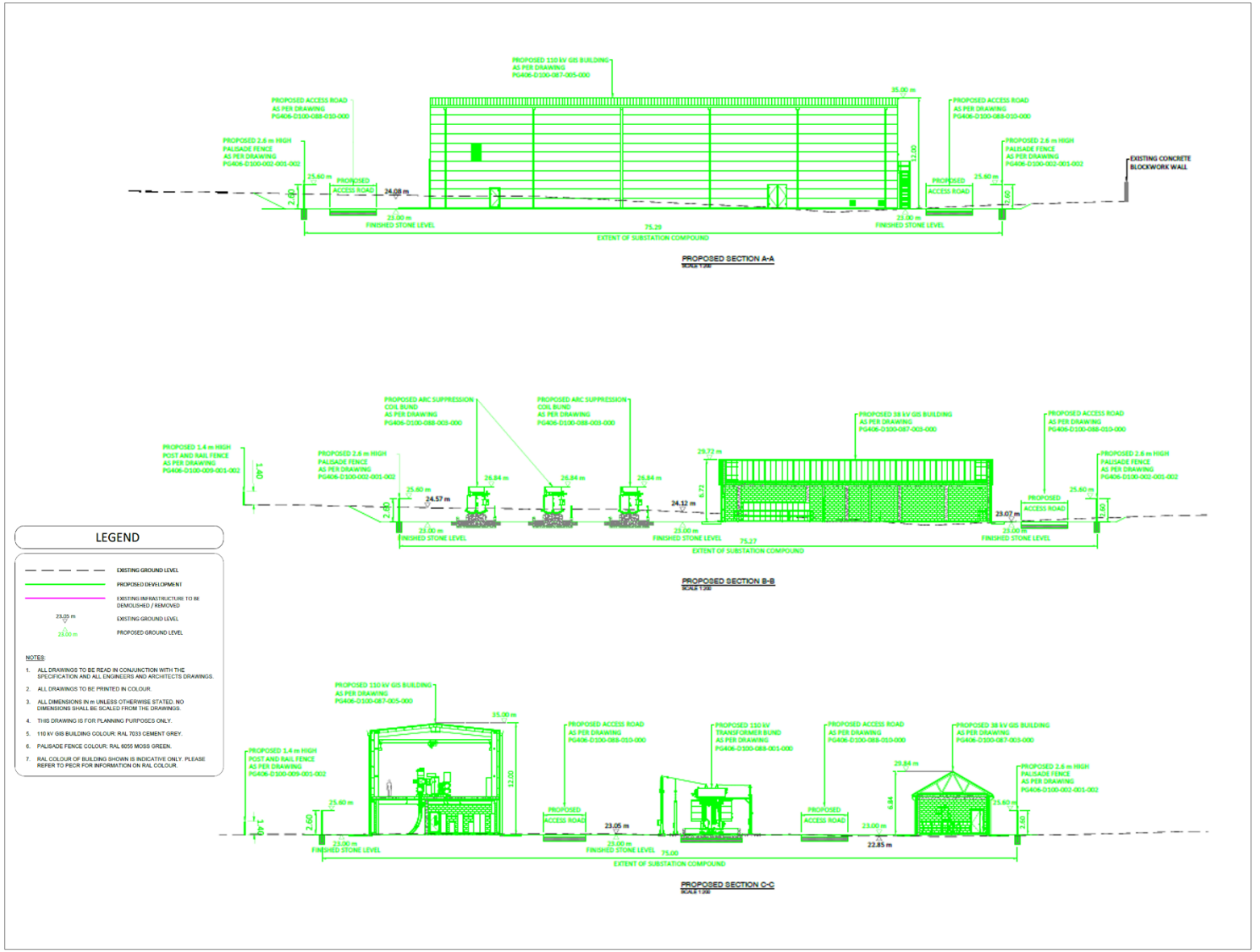
To facilitate the overhead line infrastructure, two new 110 kV double circuit overhead line/cable interface end masts will be erected, each approximately 17 metres in height. One additional 110 kV double circuit overhead line angle mast of the same height will also be constructed. A temporary 110 kV overhead line timber pole set, approximately 16 metres high, will be installed to support the temporary diversion of the existing 110 kV overhead line, which will involve around 320 metres of overhead line conductor. The permanent diversion of the existing 110 kV overhead line to the new end masts will require approximately 510 metres of conductor.

Further works will include the installation of 110 kV underground cabling between the 110 kV GIS building and the new line/cable interface end masts, as well as various associated and ancillary outdoor electrical equipment and apparatus, including additional underground cables.

Finally, site development works will encompass the provision of access roads, a car parking area, lighting, telecommunications infrastructure, fencing, landscaping, site services such as drainage, and all other necessary ancillary works.

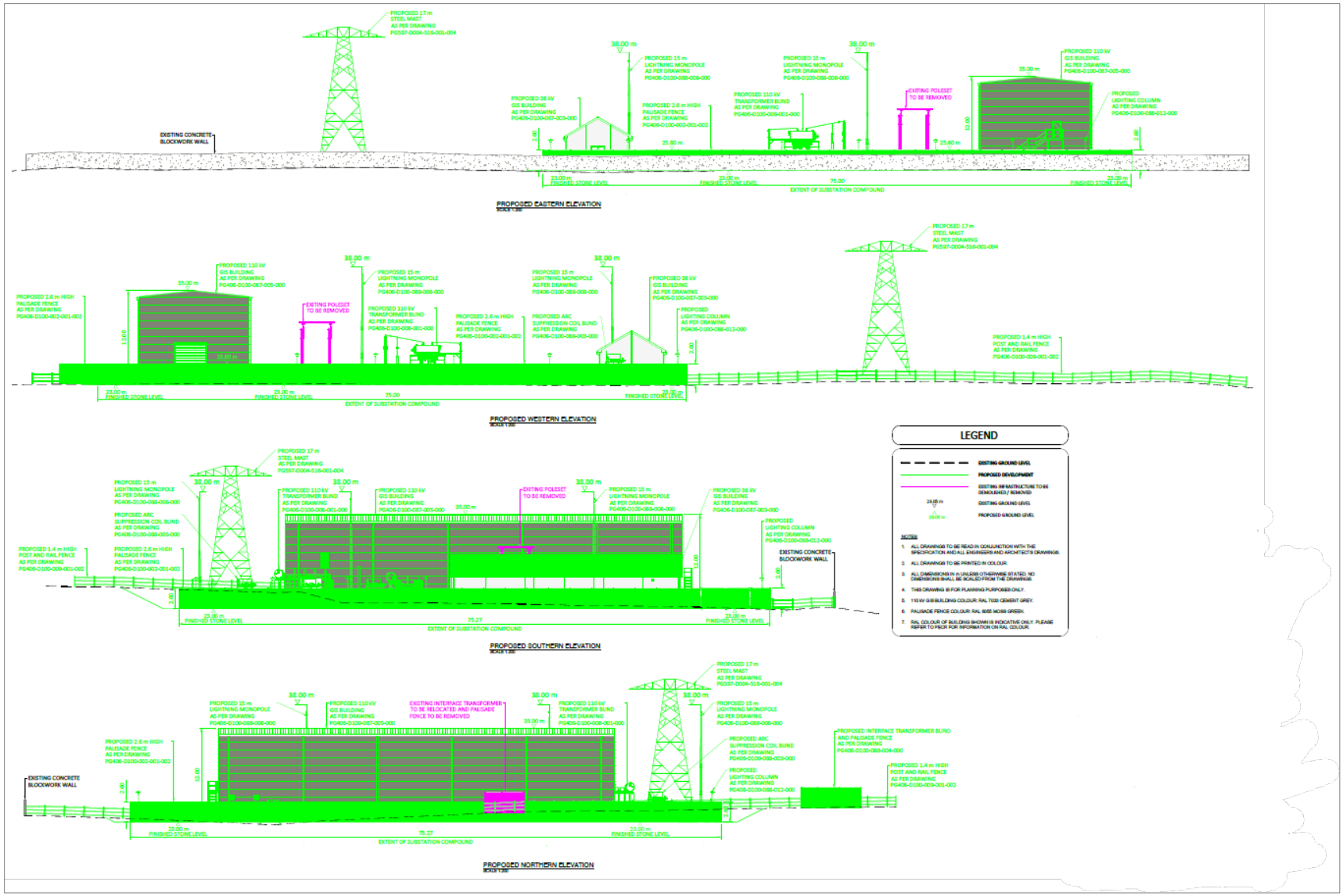
The proposed site elevations and sections are presented in Figure 3 and Figure 4.

Figure 3 Proposed Site Sections[2]



[2] Drawing no. PE492-184-067-015-001 submitted with this application

Figure 4 Proposed Site Elevations[3]



[3] Drawing no. PE492-184-067-016-001 submitted with this application

3.3 Need for the Development

As outlined in the Planning Report prepared by ESB (2025c) for the Proposed Development and submitted with this planning application, the proposed substation is considered a high-priority Strategic Infrastructure Development (SID), required to off-load the existing limerick 110 kV substation and provide additional capacity for the Greater Limerick Area and the Raheen Business Park. The Proposed Development will contribute to additional capacity and improvements in the security of supply for the area for the following reasons.

- Limerick station is a 2x63 MVA 110/30 kV station. Due to multiple applications for new connections, there will be significant additional loads of 27.2 MVA on Limerick Station. Therefore, a new station is required to cater for the load stress in Limerick Station.
- The new Ballycummin station will facilitate a reconfiguration of connections to various customers and to other substation in the area, in order to reduce existing loadings.
- There is very limited capacity available in the region for the future electrification of Heat and Transport as per Government Climate Action Plan (CAP) Targets.
- Considering the development initiatives in the Raheen Business Park area, it is predicted that the development of this region will happen at a very fast pace. In order to facilitate future developments, the strengthening of the electricity network is deemed imperative..

The Proposed Development redline boundary comprises a total 5.45 ha., and extends across the Eli Lilly site, the Roches Avenue, the Regeneron site, the Stryker Orthopaedics site, the R523 Road, across a residential property and across undeveloped green areas to the west. The reason for the redline expanding beyond ESB's ownership boundary is the need for the installation of new masts, underground cabling, diversion and the reconnection of the overhead lines that require works within the neighbour sites.

During the operational phase, the proposed operations will be limited to the substation compound, fully within ESB's ownership boundary.

3.4 Site Utilities and Infrastructure

3.4.1 Surface Water Drainage

Construction

Any surface water run-off collecting in excavations will be pumped from the excavation and treated prior to discharge to the local sewer network under permit from Irish Water.

In line with the submitted CEMP (AWN, 2025a), surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system for the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff from the site during construction.

It is envisaged that a number of silt fences will be installed to ensure silts do not flow off-site during the construction stage. These temporary surface water management works will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

Operation

According to the Engineering Services Report (ESB, 2025a) prepared by ESB to accompany this application, the surface water infrastructure during operations will include a series of SuDS measures that will mimic the natural drainage patterns of the site and replicate greenfield drainage conditions where possible.

Drainage from the proposed substation development will be collected on site by a dedicated drainage network and will discharge to a proposed soakaway. A soakaway tank with a storage capacity of 189cu.m will be located in the southwest of the Proposed Development site.

The soakaway system will manage flows during storm events and will incorporate an isolator row to enhance the removal of total suspended solids.

The new access road within the site will be drained to the underground drainage infrastructure through the use of gullies. This will then be discharged into the soakaway to allow for infiltration into the ground.

An outfall pipe from the soakaway is also provided to allow water to leave site during heavy rainfall events, when the rain entering the underground drainage system surpasses the infiltration rate. The outfall pipe will be fitted with a flow control device to limit the flow exiting the site to 2l/s/ha or the greenfield runoff rate.

All runoff will pass through a catchpit before flowing through the proposed soakaway system to catch any fine sediments.

The remainder of the compound area of the substation will comprise a permeable surface consisting of 50 mm single sized clean compound stone. The permeable compound stone will provide a means of attenuating runoff in these areas and will allow rainwater to saturate the soil. This will then either infiltrate to ground or will evaporate as it would on a greenfield site.

The surface water drainage network has been designed and simulated for a range of storm events (including 1 in 5, 1 in 30 and 1 in 100-year storm events).

3.4.2 Foul Drainage

Construction

Welfare facilities will be provided for the construction workers on site during the construction works and wastewater will be of domestic origin only; this is likely to be tankered off site by an appropriately licenced contractor. The works contractor will be required to apply to Irish Water for connection to discharge any contaminated surface water which collects in excavations, if it is required. The works contractor will be obliged to comply with any conditions of the discharge license to control discharge quality and rate of flow.

Operation

Wastewater will be of domestic origin only. Foul water from the proposed welfare facilities will discharge via a proposed connection to the existing foul water infrastructure within the northern footway of Roche's Avenue. A new foul sewer is proposed to convey wastewater to the existing infrastructure.

A Pre-Connection Enquiry was made to Uisce Éireann in June 2025. The Confirmation of Feasibility can be seen in Appendix D of the submitted Engineering Services Report (ESB, 2025a).

There will be no process discharges generated during Proposed Development operational phase.

3.4.3 Electricity

Construction

During the construction phase of the Proposed Development, temporary electricity will be supplied via portable generators until a formal connection to the national grid is established. To mitigate the risk of accidental spills or leaks, all generators will be securely bunded in accordance with environmental best

practices. Given the nature of the works, short-term power and electrical demands during construction are expected to be minimal.

Operation

During the operational phase, the Proposed Development will comprise a 2 × 63 MVA 110/30 kV station, designed to alleviate existing load stress on Limerick Station. This enhancement will contribute to increased network capacity and improved security of supply across the region. The station will be looped into the existing Limerick–Moneteen 110 kV transmission circuit, ensuring seamless integration with and reinforcement of the national grid.

Operational energy consumption is expected to be minimal, as the infrastructure is designed for efficiency and reliability. To maintain continuous functionality of network control and protection systems, a diesel generator will be installed to provide emergency standby and auxiliary power in the event of a failure or loss of the LV mains supply. The generator will operate only during such outages and will automatically shut down once mains power is restored.

3.4.4 Water Demand

Construction

Welfare facilities will be provided for the contractors on site during the construction works. These facilities may be connected to the mains system or imported with a road tanker.

Operation

During operational phase, water supply will be via connection to the 300mm diameter uPVC watermain located within Roche's Avenue via a 100mm diameter connection for the site.

Operational water demand will be from the proposed welfare facilities including one toilet (WC) and one wash hand basin (WHB). As the facility will typically be unmanned, except for maintenance and inspection works, the expected water requirement for Proposed Development operations will be minimal.

A Pre-Connection Enquiry was made to Uisce Éireann in June 2025 and a Confirmation of Feasibility was received, which can be seen in Appendix D of the submitted Engineering Services Report (ESB, 2025a). The connection was confirmed as feasible without any infrastructure updates required.

3.4.5 Lighting

Construction

Temporary construction lighting will be provided in the site entrance area, contractors compound and construction vehicle parking area for the purposes of security and safety.

Any external lighting installed to facilitate night-time working or security lighting on the site will be kept to a minimum of that required for security, health and safety purposes, and will be positioned and directed in such a manner as to minimise impacts on adjacent areas outside the site boundary and areas where sensitive ecological receptors occur.

Operation

Any new external lighting for the Proposed Development will ensure that light spillage will be limited to within the substation site only and avoid light spill to the surrounding treelines and hedges. The following recommendations should be followed during the detailed site lighting design.

The lighting should be directional on to paths and buildings only with no spillage of light to adjoining habitats. To reduce light spillage from luminaries, lights that are designed not to emit at angles greater than 70º from the vertical plane should be used. Consequently, a flat glass protector is often used to reduce light spillage. Other methods to control light spillage include:

- Shields – these can be mounted at the front or back of luminaire.
- Masking – by panting a section of the luminaire protectors, light will be blocked from penetrating through.
- Louvres – these can be either internal or external rows of slates angled to block light in a certain direction.

No white light should be permitted as this has the greatest impact on bats. Lighting should be fitted with LED luminaries using warm white colours < than 2700 Kelvins. Luminaries should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

3.4.6 Site Access, Traffic, and Parking

Construction

The proposed access to the Substation will be via a new entrance on to Roches Avenue. If required a wheel wash will be installed within the site compound to wash dirt from the wheels of trucks exiting the site. The access route will be monitored to ensure no dirt accumulates on the public road due to the construction traffic and will be cleaned if required. Site access and construction traffic signage will be established by the construction contractor.

An area to the east of the site, near to the road, has been identified for use as construction compound. This will facilitate temporary accommodation for construction phase and will also be used to accommodate temporary welfare facilities. A temporary surface will be provided comprising granular stone material with passing bays provided. Storage of fuels and refuelling will be undertaken within a bunded hardstand area.

A maximum daily workforce of approximately 45 people is expected during the peak period for construction works on site. However, typical daily workforce requirements will be less than this. Car parking for workers and visitors will generally be provided in the contractor's compound. Assuming a vehicle occupancy rate of 1.25, this would result in a maximum requirement of 36 vehicles and 72 movements per day. Traffic during construction will be managed by the construction contractor in line with the submitted CEMP (AWN, 2025a).

Operation

During operation the access will remain via the new entrance on to Roches Avenue. As the facility will typically be unmanned, there will be visits to the site for scheduled and unscheduled inspections, maintenance and repairs as necessary. A two-person crew visiting site for three days a week would be the most that would be expected on the site.

During normal operations, approximately 6 vehicle movements a week are expected to occur on average. Vehicles accessing the site will be provided with parking facilities within the station compound.

3.5 Construction phase overview

The commencement date for the development is subject to the date of grant of planning permission, pre-commencement obligations, and completion of the tender process for the selection of the contractor.

The construction works will include site preparation, construction of the main building, structures, and site finishing works. It is envisaged that these works will take approximately 12 months to complete. Following

this, electrical erection and commissioning will take place, and it is envisaged that these works shall also take a further ca. 18 months. Some overlap between civil construction and electrical installation can occur.

The construction programme may vary depending on availability of required outages of the existing 110 kV overhead line from the electrical transmission system operator, Eirgrid and the time of year, weather conditions and the availability of specialised equipment.

The timing of stages and activities are approximate based on experience of similar projects, and this is meant as a guide, rather than a definitive programme of events.

Table 3 Outline Construction Schedule

Phase	Activity	Approximate Timeline	Total
Civil Construction	Site Preparation	8 Weeks	52 Weeks
	Civil Construction	44 Weeks	
Electrical Installation	Electrical Installation	52 Weeks	78 Weeks
	Electrical Commissioning	26 Weeks	

3.5.1 Working Hours

The proposed working hours for the construction phase of the project are tabulated below in Table 4. No construction works will take place outside these hours, unless such work:

- Is required under exceptional circumstances; or
- Is carried out with the prior written approval of the local authority.

Table 4 Normal Construction Working Hours

Day	Working Hours
Monday to Friday	07:00 – 19:00
Saturday	08:00 – 16:00
Sunday or Bank Holiday	N/A

3.5.2 Construction Personnel

A maximum daily workforce of approximately 45 people is expected during the peak period for construction works on site. However, typical daily workforce requirements will be less than this. Car parking for workers and visitors will generally be provided in the contractor's compound.

3.5.3 Construction Activities

The commencement date for construction is subject to the date of grant of planning permission, pre-commencement obligations, and progression of the design to construction stage. The construction work will take place in two broad phases, Civil Construction and Electrical Installation. Details of each phase is outlined below.

3.5.3.1 Civil Construction

The exact programme of works will be proposed by the contractor prior to mobilisation to site. The following is a non-exhaustive list of the works to be carried out:

- Site entrance modifications and creation of access road.
- Demarcation of construction works area, including site levelling to prepare the works area.
- Site establishment including welfare facilities, site office, etc.

- Construction of site drainage works.
- Enabling works and the formation of a construction route.
- Construction of underground 110 kV cable ducts.
- Installation of substation earth-grid.
- Construction of GIS building, including foundations works, structural steelwork erection, cladding and building finishing works.
- Construction of civils bases for transformer bunds, lightning monopoles, compound lighting columns, LV control cable surface block ducts etc.
- Permanent foul and surface water drainage works.
- Compound stoning and paving,
- Finishing and Completion works.

3.5.3.2 Electrical Installation

Electrical installation includes the following:

- Electrical and Mechanical fit out of buildings.
- Delivery and installation of 2 No. 110 kV/38 kV Transformers and 2 No. 38 kV to MV Transformers and associated equipment. These are large pieces of electrical plant and the deliveries will be managed in accordance with regulations governing the movement of large loads.
- Deliver and Installation of 3 No. Arc Suppression Coils
- Delivery and installation of all other outdoor HV equipment.
- Delivery and installation of all 110 kV GIS switchgear
- Pulling and termination of cables.
- LV cabling and wiring of 110 kV equipment and protection and control equipment.
- Installation of compound lighting and security systems.
- Commissioning of all newly installed equipment.

3.5.4 Temporary construction facilities

3.5.4.1 Site access and signage

The proposed access to the Substation will be via a new entrance on to Roches Avenue. If required a wheel wash will be installed within the site compound to wash dirt from the wheels of trucks exiting the site during earth works and concrete pours. The access route will be monitored to ensure no dirt accumulates on the public road due to the construction traffic and will be cleaned if required. Site access and construction traffic signage will be established by the construction contractor.

3.5.4.2 Temporary laydown areas

Dedicated primary temporary laydown and storage areas will be identified for construction plant and equipment by the contractor. This area will be available for any fabrication that may be necessary.

3.5.4.3 Contractors site compound and services

To the eastern portion of Proposed Development site, an area adjacent to the Roches Avenue has been identified for use as the construction compound. This will facilitate temporary accommodation for construction phase and will also be used to accommodate temporary welfare facilities. Any discharges from the welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licensed facility. A temporary surface will be provided comprising granular stone material with passing bays provided.

Storage of fuels and refuelling will be undertaken within a bunded hardstand area. Water will be tankered on to site as required. Foul waste will be disposed off-site using appropriate facilities. A suitably bunded generator may also be used for power.

3.5.4.4 Construction mitigation and monitoring measures

The implementation of the submitted CEMP and RWMP during the construction phase will play a critical role in safeguarding the environment. These plans outline a comprehensive framework of mitigation measures, monitoring protocols, and best practice procedures designed to minimise potential environmental impacts associated with site activities. This includes the management of noise, dust, surface water runoff, waste generation, and ecological disturbance.

3.5.5 Infrastructure Construction

3.5.5.1 Foundation Construction

The design of the foundation for the Proposed Development will be subject to detailed site investigations and design. However, at this stage and based on preliminary information available, piling or other deep forms of foundation systems are not expected to be required to support the proposed structures. Confirmation on the requirement of piling or other forms of deep foundation works will be confirmed via site investigations at pre-construction stage.

3.5.5.2 Below Ground Services and Utilities Installation

Construction of the development infrastructure will involve excavation and installation of all below ground services including drainage systems, connections to existing water supplies and power, along with the routing of all cable ducting throughout the site.

Services will be surrounded with suitable engineered fill and warning tape laid to utility specification requirements. Trenches shall be backfilled with either imported fill or with suitable excavated material.

3.5.6 Construction Traffic

A maximum daily workforce of approximately 45 people is expected during the peak period for construction works on site. However, typical daily workforce requirements will be less than this. Car parking for workers and visitors will generally be provided in the contractor's compound. Assuming a vehicle occupancy rate of 1.25, this would result in a maximum requirement of 36 vehicles and 72 movements per day.

It is considered that there will be a maximum of 40 HGV's serving the site during any given daytime. As such, the two-way HGV traffic is unlikely to be higher than 5 vehicles per hour at any point of the day.

Table 5 Estimated Traffic Movements During Construction

Construction Traffic Type	No. Of Vehicles	No. Of Vehicle Movements
Average Cars/ Vans (per day)	20	40
Average HGV (per day)	10	20
Max Cars/ Vans (per day)	36	72
Max HGV (per day)	30	60
Abnormal load	6	12

Traffic during construction will be managed in accordance with the CEMP (AWN, 2025a) submitted as part of this application. The implementation of the mitigation measures outlined in the CEMP, also included in Appendix B, will ensure no significant traffic impacts arise from the construction of proposed scheme.

3.5.7 Material Volumes & Construction Waste Management

While there is no demolition associated with the Proposed Development there will be the need to remove four existing 110 kV Overhead Line timber pole sets (c. 15 m in height) and c.800 m of Overhead Line conductor.

There will be soil, stones, and made ground excavated to facilitate construction of new foundations, and the installation of underground services. The project design team have estimated that c. 7,500 m^3 of material will need to be excavated. It is currently envisaged that due to limited options for reuse the majority of the excavated material will need to be removed offsite due to the limited opportunities for reuse on site. The excavated material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal in line with relevant was management and circular economy related legislation.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

All the materials and waste during construction will be managed in accordance with the CEMP and RWMP (AWN, 2025a, 2025b) submitted with this application. The RWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also provides appropriate measures in relation to the collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

The mitigations proposed by the CEMP and RWMP to be implemented during the construction of the Proposed Development are also included in Appendix B of this ER.

3.6 Cumulation with Other Existing or Proposed Development

Schedule 7 of the Regulations of 2001[4] sets out the criteria for LCCC to determine whether a development would or would not be likely to have significant effects on the environment with due regard to cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act[5] and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment.

In order to inform the EIA screening for this development; As part of the assessment of the effects of the Proposed Development, account has been taken of other existing, permitted, or planned development within the surrounding area that have the potential to combine with the Proposed Development and result in likely significant cumulative effects. Cumulative effects are the effects arising from the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.

The identification and preliminary assessment of potential cumulative effects on the environment is facilitated via the Source-Pathway-Receptor (SPR) model which is a multi-step process. The SPR tool is

[4] Planning and Development Regulations 2001 (as amended)
[5] Planning and Development Act, 2000 (as amended)

the most cautious means of assessment which ensures that all possible impacts 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 all potential for environmental impacts can be identified at a preliminary stage without any need for detailed studies, but rather upon available desktop information.

A critical step in both assessing the Proposed Development and in determining what cumulative developments may contribute to this assessment is to establish the Zone of Influence (ZOI) for the Proposed Development. A ZOI is unique to each type of project and the environment with which it interacts.

It is imperative to make clear that not all projects within a study area are capable of combining with the Proposed Development to result in potential cumulative effects. In order for there to be a potential cumulative effect, all three elements of the SPR elements need to be present. If there is no pathway or functional link (direct or indirect) between the Proposed Development and a receptor, there is no potential for effect.

Additionally, if there is no receptor within the area of a potential impact, there is similarly no effect as it does not cause harm to the environment due to the lack of a receptor. It is acknowledged that projects like the one proposed can have an impact on activity in a larger area than only the Site itself. There is no specific guidance available for a generic zone of influence to focus the assessment of existing development, applications in progress (Proposed Development), or applications granted permission (permitted development) that may result in cumulative effects. The research area has been established using expert judgement and based on the accessibility of data and taking into consideration the potential zone of influence from the potential for environmental effects of the Proposed Development.

Generally, the closer to the works, the greater the potential for impacts. The search has been restricted to 1km of the subject site; this distance within an industrial state environment is sufficient to capture any permitted development that may give rise to significant cumulative effects.

The identification of relevant cumulative developments follows a two-fold approach. Firstly, a comprehensive search is 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. This secondary stage is conducted in alignment with the 2017 guidance from the European Union (EU), which underscores the necessity to focus on effects that are either inherently significant or possess the potential for significance. This comprehensive review is crucial in the context of assessing the potential cumulative effects of a proposed project. It aids in gauging the extent to which these existing and future undertakings might interact with the Proposed Development and allow for the exclusion of insignificant developments from any further consideration. This strategic approach ensures that resources are not expended on negligible or inconsequential effects.

The initial stage of this process is facilitated through the utilisation of the planning search tools listed below which collectively hold a comprehensive inventory of planning applications, which systematically generated a comprehensive list of relevant planning permissions granted within the immediate environs of the Proposed Development. A combination of online mapping tools was used for this search including:

- The Department of Housing, Local Government and Heritage EIA Portal[6];
- An Coimisiún Pleanála Map Search[7]; and
- My Plan National Planning Application Map Viewer[8].

[6] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1
[7] https://www.pleanala.ie/en-ie/Map-search
[8] https://www.myplan.ie/national-planning-application-map-viewer/

The main developments identified as having potential to cumulate with the Proposed Developments during the construction and operational phases are as follows.

LCCC Reg. Ref.: 24/61160 - Eli Lilly (Kinsale) Limited, The IDA Business and Technology Park, Raheen, County Limerick – Final grant received on the 19/05/2025

The development consists of a 10-year permission including all site buildings and infrastructure required to support the new Biopharmaceutical Manufacturing Campus extension with an additional floor area of approximately 67,997 square metres. This extension will include the construction of 2no. new biopharmaceutical manufacturing buildings, the extension of the existing admin building and CUP building, a new logistics sector building, a new CUP building a new wastewater treatment plant, among others.

This development is located within the Eli Lilly site boundary and within the Proposed Development site boundary. Construction works for this development have commenced in the Q2 2025 and are targeted to be completed in a period of 28 months. Therefore, construction works for this development are expected to overlap with the construction of the Proposed Development.

Construction Phase mitigation measures regarding noise, dust, pollution, biodiversity and traffic management are included within the EIAR, Natura Impact Statement (NIS), outline Construction Environmental Management Plan (CEMP), and Resource and Waste Management Plan (RWMP) included with the planning documentation. Condition 4 requires implementation of all EIAR mitigation measures. Condition 5 requires implementation of all NIS mitigation measures. Condition 6 requires an ecologist to oversee construction of the development. Condition 8 requires submission and adherence to a revised CEMP. Condition 10 sets out the archaeological monitoring requirements. Condition 11 requires submission and adherence to a revised RWMP.

Operational Phase mitigation measures regarding noise, biodiversity, visual and landscape are included within the EIAR and NIS included with the planning documentation. Condition 4 requires implementation of all EIAR mitigation measures. Condition 5 requires implementation of all NIS mitigation measures. Condition 9 sets out the SUDS requirements for site drainage.

LCCC Reg. Ref.: 22/190 - Eli Lilly (Kinsale) Limited, The IDA Business and Technology Park, Raheen, County Limerick – Final grant received on the 28/11/2022

The development consists of a 10-year permission for development of a Biopharmaceutical Manufacturing Campus with an overall floor area of 47,384 sqm. Construction of a 4-storey Biopharmaceutical Manufacturing building, a 2-storey canteen, laboratory and administration building, a 2-storey Warehouse building, a single storey Central Utilities Plant (CUP) building including 5no. Boiler stacks, among others.

This development is located within the Eli Lilly site boundary and within the Proposed Development site boundary. Construction works for this development have commenced in the Q1 2023 and were targeted to be completed in 2025. Although construction activities for this development are not anticipated to coincide with those of the Proposed Development, the operational phases of both projects may overlap, potentially resulting in cumulative impacts.

Operational Phase mitigation measures regarding noise, biodiversity, visual and landscape are included within the EIAR and NIS included with the planning documentation. Condition 13 requires implementation of all NIS mitigation and monitoring measures proposed. Condition 14 requires implementation of all EIAR mitigation and monitoring measures.

LCCC Reg. Ref.: 24/60010 - Loughmore Healthcare No.2 Limited, Bunacloka, Mungret, Co. Limerick. Appeal decision conditional grant received on the 04/04/2025.

Development including a two-storey nursing home, single storey service building and a biodiversity area on a site at Baunacloka, Mungret, Co. Limerick (which has an existing planning permission for a 82 bed

nursing home, reference P17/677 & P20/93). The proposed nursing home comprises provision of 130 no. bedspaces in 128 no. bedrooms with dining areas, communal areas, production kitchen, staff facilities and first floor terrace, internal secure landscaped courtyard, external roof plant and PV Panels, among others.

This development is situated along the R526 Road, within the western portion of the Proposed Development Redline boundary, where one of the existing overhead line masts is currently located. According to the aerial historical imagery available on google earth[9] the development has commenced construction in May 2025. According to the submitted Construction Methodology & (EMP) the construction works for this development were expected to take approximately a year to complete, therefore the construction works for the Proposed Development have potential to overlap with the construction of LCCC Reg. Ref.: 24/60010. Due to the residential nature of the development, it is not considered that it will have potential for cumulative impacts with the Proposed Development once operational.

Construction Phase mitigation measures regarding noise, dust, pollution, biodiversity and traffic management during the construction phase are included within the submitted Natura Impact Statement, Appropriate Assessment Screening, Ecological Impact Assessment, Construction Methodology & EMP, Noise Assessment, Arboricultural Impact Assessment, and Traffic Impact Assessment. Condition 2a requires implementation of all NIS and EcIA mitigation measures. Condition 2c requires the retention of a qualified ecological consultant for the duration of the development. Condition 14 requires that the construction of development shall be managed in accordance with a Construction Management Plan. Condition 15 requires that a plan containing details for the management of waste shall be submitted to, and agreed in writing with, the planning authority.

LCCC Reg. Ref.: 24/60921 – BNL Properties Ltd. Loughmore Avenue, Raheen Business Park, Ballycummin, Co. Limerick – Grant decision received on the 01/05/2025 and decision appealed by third-party on the 20/05/2025. Appeal yet to be decided.

The development consists of the expansion of the Storage and Distribution Warehouse facility permitted by Limerick City & County Council Planning Reference 22/1013, and all ancillary site development works. The proposed development comprises the construction of a new Storage and Distribution Warehouse building with associated two-storey administrative block which accommodates office, reception and staff welfare areas. Ancillary site development includes the provision of bicycle and vehicular parking, vehicular circulation areas, landscaping proposals, among others.

This development is located approximately 700m to the south of the Proposed Development. If appeal is decided to grant permission, the construction of this development will overlap with the construction of the Proposed Development. The development may also have the potential for cumulative impacts with the Proposed Development once operational.

Construction Phase mitigation measures regarding noise, dust, pollution, biodiversity and traffic management are included within the NIS, CEMP, EcIA and RWMP included with the planning documentation.

Operational Phase mitigation measures regarding noise, biodiversity, visual and landscape are included within the EcIA included with the planning documentation.

LCCC Reg. Ref.: 22/1013 – BNL Properties Ltd. Loughmore Avenue, Raheen Business Park, Ballycummin, Co. Limerick – Final grant received on the 22/06/2023.

The development consists of a new Storage and Distribution Warehouse and Associated Office Space with an overall floor area of 5682sqm. The development will include a 13m high warehouse building with an

[9] https://earth.google.com/web/

integral and attached 2 storey office. The development will also include the access roadways, footpaths, 42 space ark park with accessible car parking, EV Vehicle Charging, Covered Cycle Parking, among others.

This development is located approximately 600m to the south of the Proposed Development. According to the aerial historical imagery available on google earth[9] the development has already been constructed. Therefore, it is considered that the construction of this development will not overlap with the construction of the Proposed Development. However, the development may have potential for cumulative impacts with the Proposed Development once operational.

Operational Phase mitigation measures regarding noise, biodiversity, visual and landscape are included within the EIA Screening and EcIA. Condition 12 sets out the SuDS requirements for site drainage. Condition 16 requires adherence to all mitigation outlined in the EcIA.

LCCC Reg. Ref.: 22/841- Rockspring Developments Limited. Baunacloka, Raheen, Co. Limerick – Grant decision date received on the 02/05/2023.

The development consists of a residential development comprising 96 no. residential units, (2 no. detached houses, 16 no. semi-detached houses, 40 no. terrace units and 38 no. in 2 no. four storey blocks, a creche, pumping station with a pumped rising main connection to existing infrastructure at the Raheen Roundabout along with the construction of all associated roads, pavements, car parking, street lighting, foul and surface water drainage and all ancillary site development works.

This development is located across the R526 road, immediately to the northwest of the Proposed Development site boundary. There is no information available in public files on the proposed commencement or duration of construction works, however, a review of the aerial historical imagery via google earth[9] indicated that on May 2025, the site was in the early stages of clearance and demolition, suggesting that construction had only recently begun by that date. It is therefore concluded that construction works for LCCC Reg. Ref.: 22/841 have potential to overlap with the construction of the Proposed Development. Due to the residential nature of the development, it is not considered that it will have potential for cumulative impacts with the Proposed Development once operational.

Construction Phase mitigation measures for biodiversity are included within the submitted Appropriate Assessment & Natura Impact Report. Condition 2 requires the implementation of all NIS mitigation measures. Condition 3a requires the implementation of all EcIA mitigation and monitoring measures. Condition 3b requires the retention of a qualified ecologist for the duration of the works. Condition 7d requires the submission and agreement with the planning authority of a detailed construction traffic management plan. Condition 14 requires that the construction of development is managed in accordance with a Construction Management Plan. Condition 15 requires that the waste will be managed in accordance with an agreed plan containing details for the management of waste. Condition 16 requires that the developer shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site.

LCCC Reg. Ref.: 21/8000 - Part 8 - The Land Development Agency. Dromdarrig, Mungret, Co. Limerick. Grant decision on the 13/07/2021

The development consists of the construction of 253 no. residential units including 36 no. two bed houses; 110 no. three bed houses, 26 no. four bed houses, 2 no. six bed community dwellings, 37 no. two bed apartment units, and 42 no. one bed apartment units, with renewable energy design measures (which may be provided externally) for each housing unit.

This development is located approximately 800m northwest of the Proposed Development. A review of the aerial historical imagery via google earth[9] indicated that in May 2025 there was no evidence of construction works having commenced. It is therefore concluded that construction works have potential to overlap with the construction of the Proposed Development. Due to the residential nature of the

development, it is not considered that it will have potential for cumulative impacts with the Proposed Development once operational.

Construction Phase mitigation measures regarding noise, dust, pollution, biodiversity, archaeology and traffic management are included within the submitted Arboricultural Impact Assessment Report, Archaeological Test Trenching & Impact Assessment, Traffic & Transport Assessment, Construction Environmental Management Plan, Environmental Impact Assessment Screening and Appropriate Assessment Screening Report.

4. BIODIVERSITY

4.1 Introduction

This section provides an assessment of the effects of the Proposed Development on the ecological environment, i.e., Biodiversity, flora and fauna. It has been compiled in compliance with 2014 EIA Directive, the Planning and Development Act 2000 as amended, and the European Commission's *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) and follows the EPA *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022).

An Appropriate Assessment has also been prepared by Moore Group (2025) for the Proposed Development and supports the conclusion of Section 4 – Biodiversity.

4.2 Methodology

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

The objectives of the assessment are achieved by:

- Identifying baseline conditions of the site and its environs.
- Identifying the sensitivity of receptors with potential to be affected by changes in the baseline conditions.
- Predicting the magnitude of likely changes to the baseline receiving environment.
- Assessing the significance of effect taking into account sensitivity of receptors and magnitude of effect.
- Identifying and assessing appropriate mitigation measures, including alternatives.
- Assessing the significance of residual effects, taking account of any mitigation measures.

Surveys included Habitat surveys, Badger surveys and Breeding Bird surveys.

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

4.2.1 Study Area

While the main focus of biodiversity was on the Proposed Development site within the red line boundary (see Figure 5 below). The surrounding environment up to 150m from the redline boundary was taken into account in addition to potential biological and hydrological connectivity in relation to European sites in a Zone of Influence which is detailed further in Section 4.2.3 below.

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

4.2.1.1.1 Habitats

The area within or immediately adjacent to the Proposed Development footprint where floral species could be directly or indirectly affected during construction/operation. Invasive species were searched for during habitat surveying.

The study area of this assessment is shown in Figure 1 and Figure 2 included in the above sections.

4.2.1.1.2 Rare and/or Protected Flora

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

4.2.1.1.3 Fauna species

Other than those listed below (includes badger, otter, amphibians).

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

4.2.1.1.4 Bats

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

4.2.1.1.5 Breeding Birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the Birds Directive, and / or as SCIs within designated European sites.

4.2.2 Key Ecological Receptors (KERs)

Species considered to be Key Ecological Receptors (KERs); including floral and faunal species of conservation concern of the Proposed Development include the following.

- Meadow grassland and potential for Meadow Barley
- Red and Amber Birds of Conservation Concern in Ireland (BoCCI) (Gilbert *et al.* 2021)[10] species listed for their breeding populations.

[10] Gilbert, G., Stanbury, A., Lewis, L. (2021). Birds of Conservation Concern in Ireland 4: 2020–2026. Irish Birds 9: 523-544.

4.2.3 Zone of Influence

The ZoI, or distance over which a likely significant effect may occur will differ across the subject ecological receptors, depending on the predicted impacts and the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present along the Proposed Development. The ZoI is then informed and defined by the sensitivities of each of the ecological receptors present, in conjunction with the nature and potential impacts associated with the Proposed Development. In some instances, the ZoI extends beyond the study area (e.g. surface water quality effects of a sufficient magnitude can extend, and affect, receptors at significant distances downstream). For example, the pollution of water courses by a significant quantity of a substance that could have an effect on a sensitive habitat or species where the substance was carried downstream to a receiving environment such as a protected coastal estuary.

The ZoI of the Proposed Development in relation to terrestrial habitats is generally limited to the footprint of the Proposed Development and the immediate environs up to 150m (to take account of shading or other indirect impacts, such as air quality). Hydrogeological / hydrological linkages (e.g. rivers or groundwater flows) between impact sources and wetland / aquatic habitats can often result in impacts occurring at significant distances.

The ZoI of air quality effects is generally local to the Proposed Development construction dust tends to be deposited within 250m of a construction site, the majority of the deposition occurs within the first 50m.

With regards to hydrological impacts, the distances over which water-borne pollutants are likely to remain in sufficient concentrations to have a likely significant effect on receiving waters and associated wetland / terrestrial habitat is highly site-specific and related to the predicted magnitude of any potential pollution event. Evidently, it will depend on volumes of discharged waters, concentrations and types of pollutants (in this case sediment and/or hydrocarbons), volumes of receiving waters, and the ecological sensitivity of the receiving waters.

The ZoI of the Proposed Development in relation to likely significant effects on most breeding bird species is generally limited to habitat loss within the footprint of the Proposed Development.

4.2.4 Ecological Surveys

4.2.4.1 Habitat Surveys

The habitat assessment was carried out in two stages. The first stage comprised desktop research to determine existing records in relation to habitats and species present in the study area as defined by the area of the Proposed Development, site boundaries and surrounding buffer zones up to 150m away. This distance referred to by the standard ecological impact assessment guidance[11] is adequate to include address potential effects on mobile species such as otters or badgers, if present.

The second stage involves an evaluation of the site to establish the existing environment in the footprint of the Proposed Development area and up to 150m surrounding the redline boundary.

Habitat types were identified during fieldwork on 29 July 2025. Areas which were highlighted during desktop assessment were investigated in closer detail according to the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011). Habitats in the Proposed Development area were classified according to the Heritage Council publication "A Guide to Habitats in Ireland" (Fossitt, 2000). This publication sets out a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. This form of classification uses codes to classify different habitats based on the plant

[11] Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019).

species present. Species recorded in this report are given in both their Latin and English names. Latin names for plant species follow the nomenclature of "An Irish Flora" (Parnell & Curtis, 2012).

4.2.4.2 Non-Volant Mammals

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries.

4.2.4.3 Bats

An assessment of the suitability of the site for usage by bats was undertaken on 29 July 2025.

In order to assess the site and particularly trees for bat roost potential, the approach is to survey mature trees at Ground Level first. A 'Ground Level Tree Assessment (GLTA) was undertaken.

4.2.4.4 Otters

There are no water courses on site and a general assessment of the suitability of the site for otter was undertaken during habitat surveys on 29 July 2025.

4.2.4.5 Breeding Birds

Breeding Birds were surveyed and signs were recorded where encountered during the field walkover survey on 29 July 2025.

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

Field surveys carried out (see Section 4.2.4 below) deemed the overall lands to be unsuitable feeding and/or roosting sites for wintering birds, due to habitat conditions being dominated by hard surfaces and improved and semi-improved agricultural grassland or subject to relatively high levels of disturbance. As such it was not deemed necessary to carry out detailed Wintering Bird surveys in these areas. The results of the desk-based study have primarily informed the assessment of potential impacts on wintering bird species arising from the Proposed Development.

4.2.5 Categorisation of the Baseline Environment

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

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
- National Parks & Wildlife (NPWS) protected site boundary data;
- Tailte Éireann mapping and aerial photography;
- OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
- Digital Elevation Model over Europe (EU-DEM);
- Google Earth and Bing aerial photography 1995-2025;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
  - Natura 2000 - Standard Data Form;
  - Conservation Objectives;
  - Site Synopses;
  - National Biodiversity Data Centre records:
  - Online database of rare, threatened and protected species;
- Publicly accessible biodiversity datasets.

- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019) ; and
- Relevant Development Plans;
  - Limerick City and County Development Plan 2022-2028

4.2.6 Assessment Methodology

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

- Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2007);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, December 2009, Rev 2010);
- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- Ecological Surveying Techniques for Protected Flora & Fauna (NRA, 2008);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024).

4.3 Receiving Environment

The lands on which the proposed substation are to be constructed, comprise an area of hardstanding currently used for the storage of construction materials for the Eli Lilly development in progress, as well as an area of grassland adjacent to the northeast. The footprints of the proposed re-sited pylons comprise hard standing at the western cable tower, and a section of recently deposited earth mounding at the eastern cable tower. The land between these cable towers includes a fenced and signposted area of grassland where translocated Meadow Barley (*Hordeum secalinum*) has been propagated as part of a licenced Meadow Barley Translocation Area (MBTA). Re-strung electrical wires will cross this area, as they will the section between the western cable tower and an existing cable tower in grassland to the southwest, which will cross the R526 road and a number of hedgerows.

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

4.3.1 Designated Conservation Areas

A standalone Report for AA Screening was prepared, also by Moore Group, and the following reiterated from that report.

The potential for source pathway receptor connectivity was firstly identified and detailed information is then provided on sites with connectivity. European sites that are located within the potential Zone of Influence of the Proposed Development are listed in Table 6 and presented in Figure 6 below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 21 July 2025.

Table 6 Details of European sites within the potential zone of influence of the project

Site Code	Site name	Distance (km)[12]
002165	Lower River Shannon SAC	2.39
004077	River Shannon and River Fergus Estuaries SPA	2.67

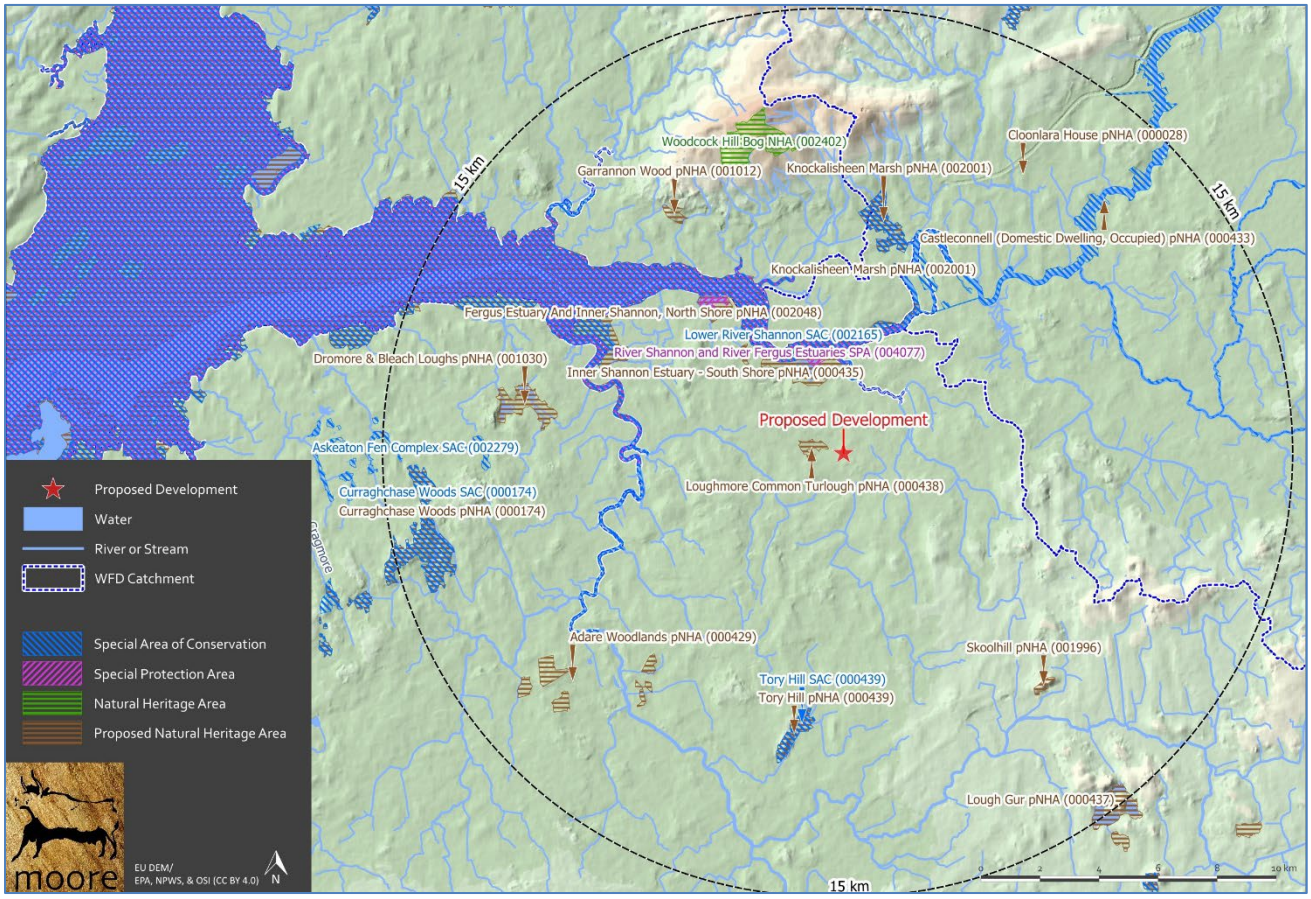
[12] Distances indicated are the closest geographical distance between the Proposed Development and the European site boundary, as made available by the NPWS. Connectivity along hydrological pathways may be significantly greater.

The nearest European sites to the Proposed Development are the Lower River Shannon SAC (Site Code 002165), 2.37km to the north, and the River Shannon and River Fergus Estuaries SPA (Site Code 004077), 2.67km to the north.

The Proposed Development is located within and adjacent to the Eli Lilly manufacturing facility at Ballycummin, in a largely industrial area on the southern outskirts of Limerick City. A review of aerial photography, Ordnance Survey Ireland (OSI) mapping and OSI Geographical Information System (GIS) data for rivers and streams indicates that there are no notable surface water features onsite and no direct hydrological pathways to offsite surface water bodies. This was confirmed during fieldwork on habitat assessment on 29 July 2025.

There is no connectivity to any European sites within a potential Zone of Influence of the Proposed Development.

Figure 5 Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development



4.3.2 Non-Designated Habitats

The lands on which the proposed substation are to be constructed, comprise an area of hardstanding (BL3) currently used for the storage of construction materials for the Eli Lilly development in progress, as well as an area of Grassy verge type grassland (GS2), adjacent to the northeast. The section of proposed underground cable currently comprises temporary access roads and car parking without vegetation but with adjacent areas of Amenity grassland (GA2). There is a larger area of Meadow type habitat (GS2) to the west which corresponds to the Meadow Barley Translocation Area. Areas to the west of this section

comprise Improved agricultural grassland (GA1), Roads (BL3), and Hedgerows (WL1). Areas of Recolonising bare ground (ED3) are also present to the northeast and southwest of the MBTA.

The main habitats recorded are presented in Figure 7. A list of habitats recorded, and their corresponding Fossitt codes is presented in Table 7.

The Meadow Barley Translocation Area is identified per the ongoing programme under NPWS licence and is indicated for information as Key Ecological Receptors.

There were no invasive species recorded on site.

Table 7 Details of habitats recorded and their corresponding Fossitt codes

Habitat	Habitat Category	Habitat Type
(G) Grassland	(GS) Semi-natural grassland	(GS2) Dry meadows and grassy verges
		(GA1) Improved agricultural grassland
		(GA2) Amenity grassland
(W) Woodland	(WL) Linear Woodland	(WL1) Hedgerows
(E) Exposed rock and disturbed ground	(E) Disturbed ground	(ED3) Recolonising bare ground
(B) Cultivated and Built land	(BL) Built land	(BL3) Buildings and artificial surfaces

4.3.2.1 Dry meadows and grassy verges Grassland (GS2)

This habitat relates to two areas within the site: the fenced Meadow Barley Translocation Area (MBTA), and the grassland in the northeast of the site. The MBTA was at survey a relatively tall sward, with Common Knapweed (*Centaurea nigra*), Yorkshire Fog (*Holcus lanatus*), Meadowsweet (*Filipendula ulmaria*), Creeping Bent (*Agrostis stolonifera*), Red Fescue (*Festuca rubra*), Wild Carrot (*Daucus carota*) and Meadow Vetchling (*Lathyrus pratensis*) the most common species. The grassland in the northeast section is dry but has had no recent management and a rank sward has developed, comprising species such as Cock's Foot (*Dactlyis glomerata*), Spear Thistle (*Cirsium vulgare*), Tufted Vetch (*Vicia cracca*), False Oat-Grass (*Arrhenatherum elatius*), Red Clover (*Trifolium pratense*), Meadow Vetchling and Meadow Buttercup (*Ranunculus acris*). Small areas in the centre of this grassland support some more calcareous flora, including Quaking Grass (*Briza media*), Bird's Foot Trefoil (*Lotus corniculatus*), Common Knapweed, and Common Spotted Orchid (*Dactylorhiza fuchsii*).

4.3.2.2 Improved agricultural grassland (GA1)

A small area of agricultural grassland lies within the site boundary, on the northwestern side of the R526 road. This supports typical species such as Perennial Rye Grass (*Lolium perenne*), Nettle (*Urtica dioica*), Meadow Buttercup (*Ranunculus acris*) and Broad -leaved Dock (*Rumex obtusifolius*).

4.3.2.3 Amenity grassland (GA2)

A small area of close-cropped amenity grassland adjacent to Roches Avenue to the northeast of the substation lies within the development boundary.

4.3.2.4 Hedgerows (WL1)

This habitat refers to the hedgerows lining the old lane immediately southwest of the MBTA, as well as the boundary hedgerow along the R526 road, the small area of hedgerow crossed in the farmland to the southwest, and the ornamental hedgerow along Roches Avenue. These hedgerows have generally been managed to maintain the existing ESB wayleave. Hawthorn (*Crataegus monogyna*) is much the commonest

species in the semi-natural hedgerows, with Elder (*Sambucus nigra*), some diseased Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*) and vigorous Ivy (*Hedera hibernica*) and Bramble (*Rubus fruticosus*) throughout. The landscaping hedgerow along the Roches Avenue perimeter includes ornamental species such as Dogwood (*Cornus* sp.), *Forsythia* and Honeysuckle (*Lonicera* sp.).

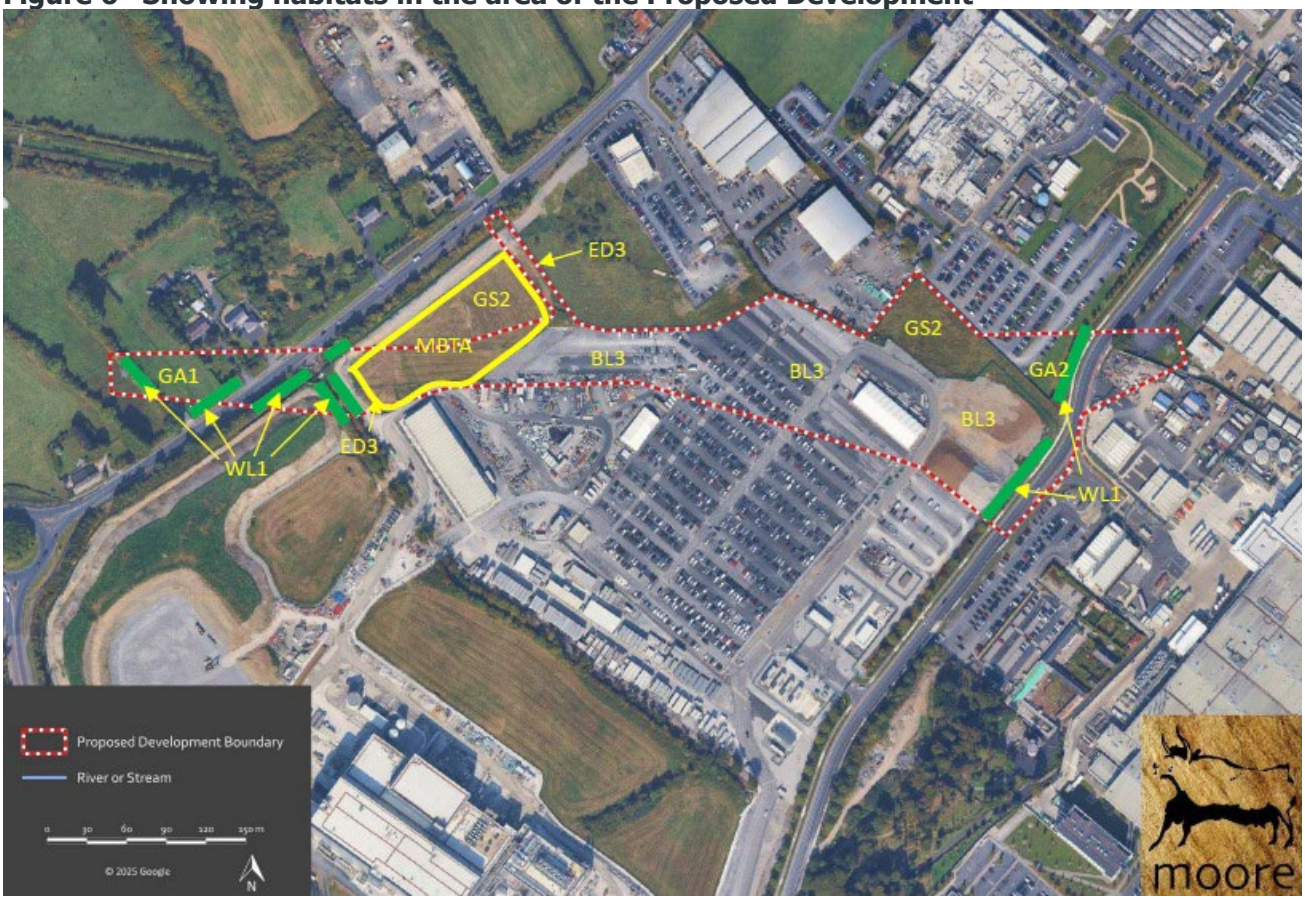
4.3.2.5 Recolonising bare ground (ED3)

This habitat refers to the areas of the site to the northeast and southwest of the MBTA, where mounds of earth and some hardstanding has recolonised with vigorous weedy growth. Species include Creeping Thistles (Cirsium arvense.), Ragwort (*Jacobaea vulgaris*), Smooth sow-thistle (*Sonchus asper*), Dandelion (*Taraxacum officinale* agg.) Silverweed (*Potentilla anserina*) and Great willowherb (*Epilobium hirsutum*).

4.3.2.6 Buildings and artificial surfaces (BL3)

This category refers to hard surfaces on site, which include public roads, carparking, internal roads and hardstanding.

Figure 6 Showing habitats in the area of the Proposed Development



4.3.3 Fauna

4.3.3.1 *Badgers*

The NBDC database was consulted for details on badger records held for the Proposed Development area. There are no records for badgers within the Proposed Development site. There were no signs of badgers or setts within the Proposed Development area surveyed during filed visits. The closest record from the NBDC is of a roadkill badger approximately 1km to the north of the Proposed Development.

4.3.3.2 *Otters*

There were no signs of otters in the study area, and no suitable habitat recorded. There is an NBDC record of a roadkill of otter along the R526 adjacent to the study area from 2009.

4.3.3.3 *Bats*

The NBDC database was consulted for details on bat records held for the area within 2km of the Proposed Development area. Five species have been recorded within this boundary; Leisler's (*Nyctalus leisleri*), Daubenton's (*Myotis daubentonii*), Brown Long-eared (*Plecotus auritus*) Common pipistrelles (*Pipistrellus pipistrellus*) and Soprano pipistrelles (*P. pygmaeus*). The site is generally of low value to bats due to the light industrial nature of the business park.

The hedgerows throughout the site were examined for potential roosts and were determined to have low roost potential.

4.3.3.4 *Birds*

All nesting birds are protected under the Wildlife Acts. Species recorded included common garden and suburban species such as Blackbird, Magpie and Woodpigeon. A list of breeding bird species recorded during fieldwork is presented in Table 8. No nests were observed during fieldwork.

Table 8 Birds recorded during fieldwork in July 2025

Birds	Scientific name	BWI Status	Habitat Type
Magpie	*Pica pica*	Green	Anywhere in lowland areas
Woodpigeon	*Columba palumbus*	Green	Gardens, woods, hedges
Robin	*Erithacus rubecula*	Green	Gardens, woods, hedges
Blackbird	*Turdus merula*	Green	Woods, gardens, hedgerows
Hooded Crow	*Corvus cornix*	Green	Woods, gardens, hedgerows
Wren	*Troglodytes troglodytes*	Green	Gardens, woods, hedges
Starling	*Sturnus vulgaris*	Green	Hedgerows, parks, gardens
Swallow	*Hirundo rustica*	Amber	Summer migrant

4.3.4 Habitat Evaluation

4.3.5 Habitat Evaluation

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

Ecological valuation: Examples –

- International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

► National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA);
- Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive County Importance:
- Area of Special Amenity.
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

► Local Importance (higher value):

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

► Local Importance (lower value):

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

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

4.4 Potential Impacts of the Proposed Development

A Meadow Barley translocation area (MBTA) was established as part of the permitted ongoing development at the site (Pl. Ref. 22/190) under the National Parks and Wildlife Service (NPWS) granted licence (No. FL07/2022) for the translocation of the protected species Meadow Barley (Hordeum secalinum) within the site. The MBTA area lies within the Proposed Development boundary. The only works proposed within this area will involve manual re-stringing cables between the two re-sited cable towers. This work will be carried out with the minimum of disturbance to the grassland habitat. There are no other rare or protected habitats recorded in the study area inside the Proposed Development boundary.

Potential impacts on the Lower River Shannon SAC (Site Code 002165), and the River Shannon and River Fergus Estuaries SPA (Site Code 004077), are unlikely due to the lack of any meaningful connectivity, and the distance of removal. Therefore, they are considered to be outside the potential Zone of Influence of the Proposed Development.

Having considered the above, significant effects on any European sites as a result of the Proposed Development can be ruled out and potential significant effects on European sites can be excluded at screening stage.

4.4.1 Construction Phase

4.4.1.1 Direct Effects on Habitats

4.4.1.1.1 Dry meadows and grassy verges (GS2)

There will be a loss of a small area of dry meadows in the northeast of the site, under the footprint of the substation. Given the historical management of grassland in the subject areas, the effects on local ecology are predicted to be ***negative*** and ***slight*** for the construction phase.

4.4.1.1.2 Improved agricultural grassland (GA1)

There will be no impact on this habitat from the minor cable re-stringing works where this habitat is located. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase.

4.4.1.1.3 Amenity grassland (GA2)

There will be no impact on this habitat. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase

4.4.1.1.4 Hedgerows (WL1)

There will be a loss of relatively small areas of fringing Hedgerow. The sections lost will be 4 to 5m either side of the cable and drainage routes and not significant in terms of the remaining intact sections which are between 45-65m in length. The potential effects on local ecology are ***negative*** and ***slight*** for the construction phase.

4.4.1.1.5 Recolonising bare ground (ED3)

Recolonising bare ground is of low ecological value. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase.

4.4.1.1.6 Buildings and artificial surfaces (BL3)

The site tracks and hardstanding are of low ecological value. The potential effects on local ecology are ***negative*** and ***imperceptible*** for the construction phase.

4.4.1.2 *Direct Effects on Fauna*

4.4.1.2.1 Badgers

There were no badgers recorded on site and there are no predicted negative effects on badgers during the construction phase.

4.4.1.2.2 Otters

There were no otters recorded, and no suitable otter habitats recorded on site and there are no predicted negative effects on otters during the construction phase.

4.4.1.2.3 Bats

No potential roost features in mature trees were identified within the site boundary. The potential effects on bat habitat are ***negative*** and ***slight*** for the construction phase.

4.4.1.2.4 Birds

There will be a minor loss of grassland and relatively short sections of hedgerow and the risk of direct impacts on birds during the construction phase can be avoided by timing. The potential effects on bird habitat are ***negative*** and ***slight*** for the construction phase.

4.4.1.3 Indirect Effects on Habitats & Fauna

There will be no indirect effects on habitats or fauna.

4.4.2 Operational Phase

4.4.2.1 *Operational Phase Effects on Habitats*

There are no predicted negative effects from the operational phase of the Proposed Development.

Overall site development will result in a short-term neutral modification of habitats which have already been modified with development. A landscape plan will be implemented as part of the development and planting will be undertaken in compliance with the Landscape Management and Maintenance Schedule (Macro Works, 2025b) developed for the site. The proposed landscape plan has been prepared to increase Biodiversity where possible and therefore will have a positive impact on biodiversity.

The potential effects on habitats are ***positive*** and ***slight*** for the operational phase.

4.4.2.2 *Operational Phase Effects on Fauna*

Overall site development will result in a neutral modification of habitats of light industrial nature and relatively low local value to fauna.

The potential effects on fauna are ***neutral*** and ***imperceptible*** for the operational phase.

4.5 Mitigation Measures

4.5.1 Construction Phase

4.5.1.1 Habitats

Potential impacts on the MBTA are unlikely given it is fenced off and monitored for progress. However, the proposed development will have to recourse to the existing management plans, submitted CEMP, and any conditions of the NPWS granted licence (No. FL07/2022).

Potential impacts on habitats will be offset by additional Landscape management and suitable planting of habitats with native species for the promotion of Biodiversity. Additionally, in line with the submitted CEMP (AWN, 2025a), key ecological receptors, such as the hedgerows onsite will be cordoned off with appropriate set back distances, as advised by the environmental/ ecological clerk of works.

4.5.1.2 Badgers

There are no mitigation measures proposed for badgers.

4.5.1.3 Otters

There are no mitigation measures proposed for otters.

4.5.1.4 Bats

In line with the submitted CEMP (AWN, 2025a), any trees with potential roosting features for bats will be checked for bats in advance of any felling/ trimming works by an experienced ecologist.

'Bat-sensitive lighting' for this development would have the following design principles under relevant Guidance (BCT & ILP 2023[13]):

- If lighting is required near site boundaries, the lighting poles will be installed on the boundary and will face inwards (i.e. towards the centre of the site). This will ensure that lighting is not directed outside the site boundaries.
- All lights around the site boundary will be fitted with directional hoods and/or luminaires to direct the light downwards onto targeted areas and to prevent unnecessary light-spill.
- The intensity of lighting will be kept to the minimum level required for safety and security.
- Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used.

These measures will apply both to temporary lighting during the construction of the Proposed Development, and to permanent lighting during the operation of the development.

4.5.1.5 Birds

Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March 1 to August 31, where possible. Pre-construction nest checks shall be undertaken by an experienced ecologist prior to works commencing where works during the breeding season are unavoidable.

4.5.2 Operational Phase

The only KER for the operational stage is Bats.

'Bat-sensitive lighting' for this development would have the following design principles under relevant Guidance (BCT & ILP 2023):

- If lighting is required near site boundaries, the lighting poles will be installed on the boundary and will face inwards (i.e. towards the centre of the site). This will ensure that lighting is not directed outside the site boundaries.
- All lights around the site boundary will be fitted with directional hoods and/or luminaires to direct the light downwards onto targeted areas and to prevent unnecessary light-spill.
- The intensity of lighting will be kept to the minimum level required for safety and security.
- Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used.

These measures will apply both to temporary lighting during the construction of the Proposed Development, and to permanent lighting during the operation of the development.

4.6 Monitoring or Reinstatement Measures

There are no requirements for monitoring of habitats other than the ongoing Meadow Barley translocation site monitoring currently undertaken by Eli Lilly under the permitted Pl. Ref. 22/190.

There are no requirements for monitoring of fauna.

[13] Bat Conservation Trust & ILP. 2023. Guidance Note GN08/23 Bats and Artificial Lighting at Night.

A Landscape Plan (Macro Works, 2025a) has been prepared to increase Biodiversity where possible. This involves, maintaining the laneway hedgerows areas for encouraging biodiversity and planting native and managing wildflower areas where feasible.

In line with the submitted Landscape Management and Maintenance Schedule (Macro Works, 2025b), the management of the landscape shall include appropriate seasonal vegetation cutting, replanting saplings to replace hedges, rough and grassy verges, among others, allowing unmanaged verges to develop natural wildflower components. The proposed management and maintenance of the landscape plan will include, but will not be limited to:

Hedgerows

- In the first growing year it is important to control the development of competing vegetation and weeds along the base of the hedgerow. This will help the overall establishment of the lower branches of the plants, giving a more favourable dense basal layer to the hedgerow. Manual weeding is preferable as chemical herbicides can damage young hedgerow plants. Mulching immediately after planting will also help to suppress any weeds. Noxious weeds (Dock, Thistle, Ragwort) shall not be allowed to flower and all such weeds shall be killed or removed at each maintenance visit.
- Once established new sections of hedgerow should be trimmed on a 2-3 year rotation to encourage flowering pollinators and fruiting for birds. This will encourage faster hedgerow growth, which will ensure a natural, bushy form. When trimming hedgerows it is important to use reciprocating bar cutters that slice through branches leaving a neater cut. This gives the plants a better chance of healing without infection. Hedgerow trimming and maintenance should only take place between the 1st of September and the last day of February to avoid harming nesting birds.
- Existing sections of hedgerow should also be trimmed on a 2-3 year rotation to encourage gradual consolidation to a minimum height of 4m and to promote dense and bushy habit. Trees and hedgerows are not to be cut during nesting and breeding season between the **1st March and the 31st August**, in order to protect nesting birds.
- If gaps become apparent in the hedgerows over time, long-term management solutions (20-30 year intervals) such as laying or coppicing may be needed and will help to retain the hedgerows biodiversity, density and structure.

Field Margins/Grass Seeding

- It will be important to flail this margin every year (Sept. 15th to Feb.28th) to cut back the vegetation and prevent the hedgerow from encroaching onto the field margin. Cutting the ground vegetation will allow light down to ground level and thus encourage wild flowers to germinate the following year.

Weeding

- Throughout the aftercare period keep all shrub planting areas weed free. For tree planting keep an area of 1 m. in diameter around each planting station in a weed free condition. This may be achieved by the use of an approved herbicide or by regular cultivation. A minimum of 3 visits for weed control will be required during the growing season. All injurious weeds, will be removed from the remainder of each transplant tree or shrub plot. The growth of herbaceous material between the weed free planting stations should be controlled by strimming twice per year.

Replacements

- Shrub areas – all dead stock shall be replaced at the end of each growing season to obtain 100% stocking.
- Cell grown/root trainers and transplant planting – throughout the aftercare period, all dead stock shall be replaced at the end of each growing season to obtain 90% stock providing that failures are evenly distributed throughout both planting areas and species
- Standard trees – throughout the aftercare period all dead and diseased stock shall be replaced at the end of each growing season.

The Landscape Plan has been prepared in consultation with the project ecologist (Moore Group) in order to incorporate elements of the existing environment, consider loss and apply appropriate mitigation with sustainable planting of replacement woodland, scrub and linear features in particular with native species of local type and provenance.

4.7 Residual Effects of the Proposed Development

4.7.1 Construction Phase

With the implementation of the prescribed mitigation measures set out above, the residual effects on the local bat population are predicted to be not significant overall.

With the employment of appropriate mitigation measures with regard to local biodiversity, the Proposed Development effect on biodiversity is anticipated to be ***short term, negative*** and ***not significant***.

4.7.2 Operational Phase

With the employment of appropriate mitigation measures with regard to local biodiversity, the Proposed Development will have a ***positive, slight*** and ***long-term*** effect on biodiversity.

4.8 Cumulative Impacts of the Proposed Development

Cumulative effects are described by the EPA as the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. In combination effects are considered in the appropriate assessment process as an assessment of the potential adverse effects of a plan or project in combination with other plans or projects. The underlying intention of the in-combination provision is to take account of cumulative effects.

The Proposed Development is primarily located on brownfield land. Construction will incur loss of biodiversity but landscaping at perimeters and replacement planting in compliance with the Landscape Management and Maintenance Schedule (Macro Works, 2025b) will result in protecting ecological corridors and providing new habitat.

Permitted developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement for regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard. Any new applications for the Proposed Development area will be assessed on a case-by-case basis initially by Limerick City and County Council which will determine the requirement for Ecological Impact Assessment and/or AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

There are no predicted significant in-combination effects given that the Proposed Development would not have any adverse effects on the distant coastal European sites considered in the assessment, nor will it have any significant effects on Biodiversity.

With the employment of appropriate mitigation measures with regard to local biodiversity, the cumulative effect during construction is considered to be ***negative, imperceptible*** and ***short-term***.

With the employment of appropriate mitigation measures with regard to local biodiversity, the cumulative effect during operation is considered to be ***neutral, imperceptible*** and ***long-term***.

5. LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

5.1 Introduction

This section assesses and evaluates the potential impacts of the development on land, soils, geology, hydrogeology and hydrology aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

5.2 Methodology

This section evaluates the effects, if any, which the development will have on Land, Soils, Geology, Hydrogeology and Hydrology as result of the Proposed Development.

The rating of potential environmental impacts on the land, soils, geology, hydrogeological and hydrological environment is based on the NRA (2009) criteria for rating the importance, magnitude and significance of impacts, which take account of the quality, significance, duration and type of impact characteristic identified. The rating of potential environmental effects on the land, soil, geological, hydrogeological and hydrological environment follow the EPA Guidelines on the description of impacts as included in Table 2, which takes account of the quality, significance, duration, and type of effect characteristic identified.

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

- Geological heritage sites near the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The quality, drainage characteristics and range of agricultural uses of soil around the subject site;
- High yielding water supply springs/ wells near the site to within a 2km radius and the potential for increased risk to these sources presented by the Proposed Development;
- Classification (regionally important, locally important) and the extent of aquifers underlying the site perimeter area and increased risks presented to these by the Proposed Development associated with aspects such as removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, or change in groundwater quality;
- Natural hydrogeological/ karst features in the area and the potential for increased risk presented by the activities on site;

The following sources of information were consulted:

- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).

5.2.1 Sources of Information

Available information on the land, soils, geology, hydrogeology and hydrology for the site has been compiled from accessing national databases and archives where available. The collection of baseline regional data was undertaken by reviewing the following sources:

- Geological Survey of Ireland (GSI) - on-line mapping (www.gsi.ie), 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;

- Current EPA on-line database – EPA Maps/Catchments.ie water quality monitoring data for watercourses in the area;
- 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);
- Limerick County Council Development Plan 2022-2028;

Site specific information was derived from the following reports which have been included with this planning application:

- Engineering Services Report (ESB, 2025a)
- Flood Risk Assessment (ESB, 2025b)

5.3 Receiving Environment

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

5.3.1 Site Setting and Land Use

The majority of subject site is zoned under the Limerick Development Plan 2022-2028 as 'High Tech/Manufacturing Campus' (to provide for office, research and development, high technology, regional distribution/ logistics, manufacturing and processing type employment in a high quality built and landscaped campus style environment) with a small area to its western portion zoned as 'New Residential' (to provide for new residential development in tandem with the provision of social and physical infrastructure).

While the Proposed Development itself does not constitute a high-tech or manufacturing facility, once operational the proposed substation be fully comprised within 'High Tech/Manufacturing Campus' lands and will have a critical enabling function by supporting the infrastructure needs of such industries in the Raheen area. Its presence will help facilitate future growth and investment aligned with the strategic objectives of the zoning designation. For that reason, the development is considered well suited to its zoning designation.

The site is relatively flat with a gentle slope Northwest to Southeast. The level at the centre of the site is approx. 23.80 mAOD. Site levels range from approx. 24.40 mAOD at the Northwestern boundary to 23.30 mAOD at the Southeastern side. A topographic survey is included as Appendix B to the Flood Risk Assessment included with this application (ESB, 2025b).

5.3.2 Soils

The GSI/Teagasc (2025) mapping currently denotes 2 no. principal soil types occurring within the site boundary, comprised primarily of deep well drained mineral soil derived from mainly parent materials. These soils are identified as follows:

- The north-eastern portion of the site is underlain by deep well drained mineral – mainly acidic soil derived from limestones (BminDW); and,
- The south-western portion of the site is underlain by cutover peat (Cut)

5.3.3 Subsoils (Quaternary)

The subsoil present across the site is:

- Cut Peat (Cut) – A small portion of the western section of the site is composed of Cut Peat. This unit is made up of fine-grained peat material.

- Limestone till Carboniferous (TLs). The north-eastern section of the site is composed of limestone till. This till is made up of glacial clays which are less permeable than alluvium subsoils. The proposed main substation compound will be fully comprised on TLs subsoil type.
- Made Ground (MADE) – this unit defines areas that have been covered in hardstanding area like tarmac and concrete due to industrial development.

As informed by the Engineering Services Report prepared by ESB Networks (2025a) for the Proposed Development an Infiltration testing to BRE 365 was conducted in the adjacent Eli Lilly site in 2022. The infiltration rates varied throughout the site but an infiltration rate of 23.3m/hr was accepted for the infiltration rate within the proposed design.

5.3.4 Bedrock Geology

Reference to the GSI Bedrock Geology Map indicates that the site is underlain by Visean Limestones (undifferentiated), Volcaniclastic Rocks and Basalt.. According to GSI, the limestone rocks make up the majority of the site to the west, while the volcanic rocks are located to the eastern portion of the site where the substation compound will be located, both bedrock types are classified as part of the Carboniferous System and Dinatian Series. The basalt is limited to a very small portion to the northeastern portion of the site.

5.3.5 Aquifer Classification and Vulnerability

Reference to the GSI National Draft Bedrock Aquifer Map for the site indicates that the site is predominantly underlain by a Locally Important Aquifer (Lm) – 'Bedrock which is Generally Moderately Productive' with the eastern portion of the site underlain by a Locally Important Aquifer (LI) – 'Bedrock which is Moderately Productive only in Local Zones'. The proposed substation compound will be located within the LI aquifer classification.

Aquifer Vulnerability is a term used to represent the intrinsic geological and hydrological characteristics that determine the ease with which groundwater may be contaminated generally by human activities.

The GSI (2024) online mapping shows the site is underlain by one groundwater vulnerability class. The groundwater vulnerability is considered '*High*'. This class indicated that there is 3 – 5 meters of low permeability overburden. The vulnerability assessment is categorised as shown in Table 9 which is an extract from the Vulnerability Mapping Guidelines[14].

[14] Source: DoELG, EPA, GSI, 1999

Table 9 Vulnerability Mapping Guidelines[14]

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

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

5.3.6 Groundwater Wells and Flow Direction

The GSI Well Card Index is a record of wells drilled in Ireland, kept by the Geological Survey of Ireland. This record is not comprehensive as the licensing of wells is not currently a requirement in Ireland. Based on the GSI Well Card data there are no known wells in the immediate vicinity of the site but several wells occur in the wider region. The well in closest proximity to the site is a dug well (1415SEW038) located approximately 0.35 km north of the site. There are a number of other wells in the farther vicinity of the site which are used for industrial abstraction purposes and agricultural purposes, however, there is no risk to these water supplies from the site as no significant dewatering is proposed as part of the Proposed Development. The area is serviced by public mains therefore it is unlikely that any unidentified wells in the immediate vicinity are used for potable water supply.

There are no groundwater drinking water protection areas within the immediate vicinity. There are no source protection areas in the vicinity of the site, and the site is not located near any public groundwater supplies or group schemes with the nearest approximately 9.2 km to the south-east (Fedamore PWS).

It is assumed that the local groundwater flows east to west towards the Barnakyle River and will likely be in line with the local topography. The Barnakyle River is the dominant hydrological feature in the immediate area while the regional groundwater flow is assumed to be south to east to west towards the coastline given that the sea is the dominant hydrological feature on a regional basis.

5.3.7 Hydrogeological Features

There is no evidence of springs or karstification within the site boundary. There are a number of karst features located to the north of the site according to the GSI Karst and well database. As mentioned, the site is underlain by Visean Limestones (undifferentiated), Volcaniclastic Rocks and Basalt.. The GSI karst data base indicates two turloughs to the south and northwest of the site. Visean limestones are known to be susceptible to solution weathering which can enhance permeability.

5.3.8 Hydrology

According to the EPA maps, the Proposed Development site lies within the Shannon Estuary South Catchment (Hydrometric Area 24) and the Ballynaclogh sub-catchment. The current EPA watercourse mapping does not include any existing streams within the subject site boundary; a review of the historical mapping records provided within the GeoHive website[15] do not indicate any watercourses within the site.

[15] https://www.arcgis.com/apps/webappviewer/index.html?id=3ae19cc156bf4706a929304bf8fcc4f6

The Barnakyle River is located c. 940m to the south of the site and discharges into the Maigue Estuary (European Code IE_SH_060_0700), and subsequently into the Upper Shannon Estuary (European Code IE_SH_060_0800).

There are no recorded Recreational Waters, Bathing Waterbodies or Drinking Water Rivers within the study area.

5.3.9 Drainage and Water Supply

According to the ESB Engineering Services Report (ESB, 2025a) prepared for the Proposed Development there is currently an existing IDA foul water drainage pipe located within the southern footway of Roche's Avenue. The pipe diameter is 225mm and it falls from west to east. There is no Uisce Éireann foul infrastructure adjacent to the site.

It is proposed to discharge foul water generated by the welfare facilities in the substation building to the existing foul water infrastructure within the southern footway of Roche's Avenue. A new foul sewer is proposed to convey wastewater to the existing infrastructure.

There are also two existing IDA owned surface water drainage pipes located within the northern footway of Roche's Avenue, a 300mm diameter pipe is flowing west to east and discharges into a drainage ditch on the Eli Lilly site, and a 350mm diameter pipe falls from west to east, flowing back into the IDA site.

Surface water from the proposed substation will be managed on-site via a dedicated drainage network discharging into a soakaway system located in the southwest corner of the site, with a storage capacity of 189 m^3. Runoff from the new access road will be collected through gullies and directed into the soakaway for infiltration. An outfall pipe, fitted with a flow control device to maintain discharge at 2 l/s/ha (greenfield runoff rate), will allow excess water to exit the site during heavy rainfall. All runoff will pass through a catchpit to capture fines before entering the soakaway. The remaining compound area will feature a permeable surface of clean 50 mm stone, enabling natural attenuation and infiltration or evaporation of rainwater, consistent with greenfield site conditions.

In terms of water supply, there is currently an Uisce Éireann 300mm diameter Ductile Iron watermain and a 300mm diameter uPVC watermain within Roche's Road. It is proposed to connect to the 300mm diameter uPVC watermain located within Roche's Avenue via a 100mm diameter connection for the site.

5.3.10 Flood Risk

A Flood Risk Assessment (FRA) was prepared by ESB Networks (2025b) for the Proposed Development and has concluded that the construction of the proposed Ballycummin 110 kV Substation and associated works is not considered at risk to flooding within the subject site.

The Proposed Development site is located in Flood Zone C, and the proposed substation is classified as a highly vulnerable development which is permissible in Flood Zone C.

Additionally, the proposed surface water drainage strategy aims to mimic the natural drainage patterns of the site in accordance with the Best Management Practices of SuDS. The surface water proposals will replicate the greenfield drainage conditions of the site where possible.

Overall, the FRA concludes that the Proposed Development will not increase the current flood risk in the catchment.

5.3.11 Groundwater and Surface Water Quality

Presently, the groundwater body in the region of the site (Limerick City Southwest GWB – IE_SH_G_141) is classified under the WFD Risk Score system (EPA, 2025) as 'Good Status' and the risk score assigned to this groundwater waterbody is currently 'At risk'.

The most recent published status (www.epa.ie - River Waterbody WFD Status 2016-2021) of the Barnakyle River is 'Moderate' at the Proposed Development site and its environmental risk is qualified by the WFD as 'At Risk of Not Achieving Good Status'.

5.3.12 Rating of Site Importance of Geological, Hydrogeological and Hydrological Features

Based on the TII (previously NRA) methodology (2009), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as *'Low Importance'* due to the fact that the local geological attribute has a low quality, significance or value on a local scale. There are no extractable minerals or areas of geological heritage, and the site area in its majority is zoned as 'High Tech/Manufacturing Campus' with a small area to its western portion zoned as 'New Residential'. Therefore, the proposed type of development is considered appropriate for its zonation.

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 quality significance or value on a local scale. This is based on the assessment that the aquifer is a Locally Important Aquifer.

Based on TII (NRA) methodology (2009), criteria for rating site importance of hydrological features, the importance of the hydrological attributes in the site area is rated as *'Medium importance'* with high quality or value on a local scale, due to the water quality of the nearby Barnakyle River.

5.4 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.4.1 Construction Stage

With construction there can be potential for the underlying groundwater to become contaminated with pollutants associated with construction activity. If a spill occurs, contaminated water and collected surface water run-off which arises from construction can pose a short-term risk to the underlying water table if contaminated water is allowed percolate to the aquifer unmitigated.

Contaminated water and collected surface water run-off also pose a risk to surface water bodies and downstream habitats. As the Proposed Development does not have a direct hydrological connection to surface water bodies, the main potential impacts will be associated with contaminated discharges entering the surface water drainage.

The potential of contamination is associated with the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance.
- Cement/concrete (increase turbidity and pH) – arising from concreting works, concrete washout water, and other concrete additives.
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or stored fuels, oils, and materials.
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

In the absence of mitigation, rainfall run-off and potential dewatering water (perched groundwater) during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may in turn impact on local infiltration capacity. Concreting operations pose a potential risk of discharging concrete materials into exposed surfaces and percolate to the underlying groundwater. Concrete, especially the cement component, has a high alkalinity level. There is also the

potential risk of unintentional discharge of stored materials like fuels, oils, and paints, which could have negative impacts on the underlying groundwater.

Accidental discharges can also occur from welfare facilities during construction activities. Wastewater can contain high levels of bacteria, chemicals and organic matter, which could contaminate nearby water sources if discharged incorrectly. The establishment and use of welfare facilities and connection to the existing combined foul sewer, ensures that there are no potential significant impacts.

It is acknowledged that the excavation works will result in the local removal and reinstatement (including infilling) of the 'protective' topsoil, made ground (fill), subsoil and bedrock cover across the development area at the site. Capping of significant areas of the site by hardstand/ building following construction and installation of drainage will minimize the potential for contamination of the aquifers beneath the site. There are no significant potential impacts associated with the removal of topsoil, made ground (fill), subsoil and bedrock cover across the site.

Overall, without the implementation of mitigation measures the impact of the Proposed Development on land, soils, geology, hydrogeology and hydrology is anticipated to be ***negative, slight,*** and ***short-term.***

5.4.2 Operational Stage

The Proposed Development will result in a slight reduction in undeveloped and greenfield land. However, once operational the proposed substation will be fully located within lands zoned for High Tech/Manufacturing use and the Proposed Development will play a key role enabling future developments in the Raheen area.

The development of the proposed substation will result in an expansion of hardstanding surfaces, leading to a reduction in permeable ground and a corresponding increase in surface water runoff during operational phase.

The majority of the surface water runoff during the operational phase of the Proposed Development will be infiltrated to ground through soakaway. The proposed surface water drainage scheme has been designed to mimic the natural drainage patterns of the site and water storage up to the 1 in 100-year rainfall will be provided. Surface water runoff from the Proposed Development will be discharged at a controlled rate to replicate greenfield conditions and therefore increased run-off during operations is not expected to cause negative impacts.

The Proposed Development has received a Confirmation of Feasibility Letter from Uisce Éireann for the proposed water and wastewater connections required for the operational phase of Proposed Development. Operational wastewater will comprise welfare discharges only and will be discharged to the public foul sewer. There will be no process wastewater generated from Proposed Development. No potential impacts from wastewater are foreseen during the operational phase of the Proposed Development.

During the operational phase, there is a potential risk of hydrocarbon spills and leaks from the proposed emergency generator and power transformers; to mitigate this, the generator will either be housed within a plinth-mounted bunded area designed to contain accidental discharges, or consist of self-bunded units, and the proposed transformers will be located within a bunded enclosure capable of holding 110% of the oil volume and include an automated dewatering system for oil-water separation. In addition, any bulk chemical storage on-site will be appropriately managed and bunded in line with environmental best practices. All staff will be required to follow a detailed method statement outlining safe procedures for filling and refuelling operations, as well as protocols for managing any accidental releases to ground. All staff must be trained in emergency procedure and spill response kits will be made available in case of any accidents.

Overall, without the implementation of standard mitigation measures the impact of the Proposed Development on land, soils, geology, hydrogeology and hydrology is anticipated to be ***neutral, imperceptible,*** and ***long-term.***

5.5 Mitigation and Monitoring Measures

5.5.1 Construction Stage

A CEMP (AWN, 2025a) and a RWMP (AWN, 2025b) have been prepared for the Proposed Development and included with the application documentation. The CEMP and RWMP will be live documents and will go through a number of iterations before works commence and during the works. It sets out the requirements and standards which must be met during the construction stage and include the relevant mitigation measures outlined in this report and any subsequent planning conditions relevant to the Proposed Development.

Compliance with the CEMP and RWMP will ensure effective soil and water management during construction. All relevant personnel working on the site will be trained in the implementation of the site emergency response procedures in case of potentially polluting events.

The construction and environmental management strategy relating to soils, geology, hydrogeology, and hydrology is outlined below, as detailed in the submitted CEMP and RWMP. For further details on the proposed mitigation measures, please refer to the CEMP (AWN, 2025a) submitted with this application.

5.5.1.1 Ground Conditions and Excavated Material

In the unlikely event that contaminated material is discovered on site, it will be segregated, tested, and classified as clean, inert, non-hazardous, or hazardous in accordance with EPA guidelines *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* and *EC Council Decision 2003/33/EC*. Any Asbestos Containing Materials (ACMs) identified will be removed by a licensed contractor in compliance with relevant asbestos regulations and disposed of at an authorised facility. In the unlikely event that hazardous soil or historic waste is encountered during construction, the contractor will notify Limerick City and County Council (LCCC) and submit a Hazardous/Contaminated Soil Management Plan detailing estimated volumes, location, mitigation measures, disposal routes, and waste collector information. Where contamination hotspots require additional engineering solutions, these will also be included in the plan submitted to LCCC.

5.5.1.2 Surface Water Management & Pollution Control

Management of Suspended solids in run-off

Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and also stored in receptacles, where possible. In order to minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable covers.

If dewatering is required, there will be no direct pumping of silty water from the works to any watercourse. Sediment entrapment facilities will be installed to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area should pass through a sediment entrapment facility before it exits the site and flows downstream such as straw bales, silt fencing, silt barriers and diversion dams.

Concrete Run-off

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Wash-outs will only be allowed to take place in designated areas with an impervious surface but preferably will be directed back to the concrete batching plant for larger machinery e.g. concrete delivery trucks.

Accidental Spills and Leaks

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks will be kept in the material storage area in suitable containers and will be appropriately bunded as required. Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated areas of the site, where possible, which will be kept away from surface water drains.

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

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

- Refuelling will be undertaken off site where possible;
- Where mobile fuel bowsers are used the following measures will be taken:
  - Fuel and oil storage on site, including generator fuel tanks, shall be in tanks that are externally bunded and lockable. Bunds shall be capable of containing at least 110% of the largest capacity vessel stored therein and have sufficient freeboard. Alternatively, where suitable, integrally bunded tanks may be used. No pipework or other ducting should pass through the bund floor or walls and there should be no direct outlet;
  - Operatives must have spill response training;
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays; and
  - Small plant, such as pumps, that must remain in-situ, should be refuelled from approved jerry cans with pouring nozzles in conjunction with drip trays. Spill kits shall be carried by all refuelling vehicles.

Monitoring

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 10m from surface water receptors. Additional checks will take place following and during period of particularly heavy rain as well as before, during and after any dewater or water pumping activities. A regular log of 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 reoccur.

5.5.2 Operational Stage

During operations, the maintenance of appropriate generator and transformer bunding and surface water drainage system, including interceptors, and foul sewer is recommended to minimise any accidental discharges to soil or groundwater.

5.6 Residual Impacts of the Development

5.6.1 Construction Phase

The implementation of mitigation measures outlined in the CEMP(AWN, 2025a) and also included in Appendix B will ensure that the predicted impacts on the land, soils, geological, hydrogeological, and hydrological environment do not occur during the construction phase and that the residual impact will be ***short-term, imperceptible*** and ***neutral.*** Following the TII criteria for rating the magnitude and significance of impacts on the land, soils, geological, hydrogeological and hydrological related attributes, the magnitude of impact is considered **negligible**.

5.6.2 Operational Phase

The maintenance of appropriate generator and transformer bunding and surface water drainage system will ensure that the predicted impacts on the land, soils, geological, hydrogeological and hydrological environment do not occur during the operational phase and that the residual impact will be ***neutral, imperceptible,*** and ***long-term***. Following the TII criteria for rating the magnitude and significance of impacts on the land, soils, geological, hydrogeological and hydrological related attributes, the magnitude of impact is considered **negligible**.

5.7 Cumulative Impacts of the Development

Taking into account the implementation of the outlined mitigation measures, the Proposed Development is expected to have a neutral impact on land, soils, geology, hydrogeology, and hydrology, with no significant cumulative effects on surrounding developments. Mitigation measures have also been integrated into the design of each permitted development, which will be required to comply with their respective planning conditions and emission limits.

Accordingly, it is concluded that no significant effects between the Proposed Development and committed/ permitted developments will occur with respect to land, soils, geology, hydrogeology, and hydrology during either the construction or operational phases.

6. AIR QUALITY AND CLIMATE

6.1 Introduction

This section assesses and evaluates the potential impacts of the development on air quality and climate. 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.

6.2 Methodology

The principal guidance and best practice documents used to inform the assessment of potential impacts on Air Quality and Climate is summarised below.

- 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 (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management (IAQM), 2024);

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) outlines an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

Construction phase traffic also has the potential to impact air quality and climate emissions. The UK Highways Agency Design Manual for Roads and Bridges (DMRB) guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance, this approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic does not meet the above scoping criteria. Therefore, a detailed air quality modelling assessment has been scoped out as there is no potential for significant impacts to air quality during construction as a result of traffic emissions.

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the Proposed Development.

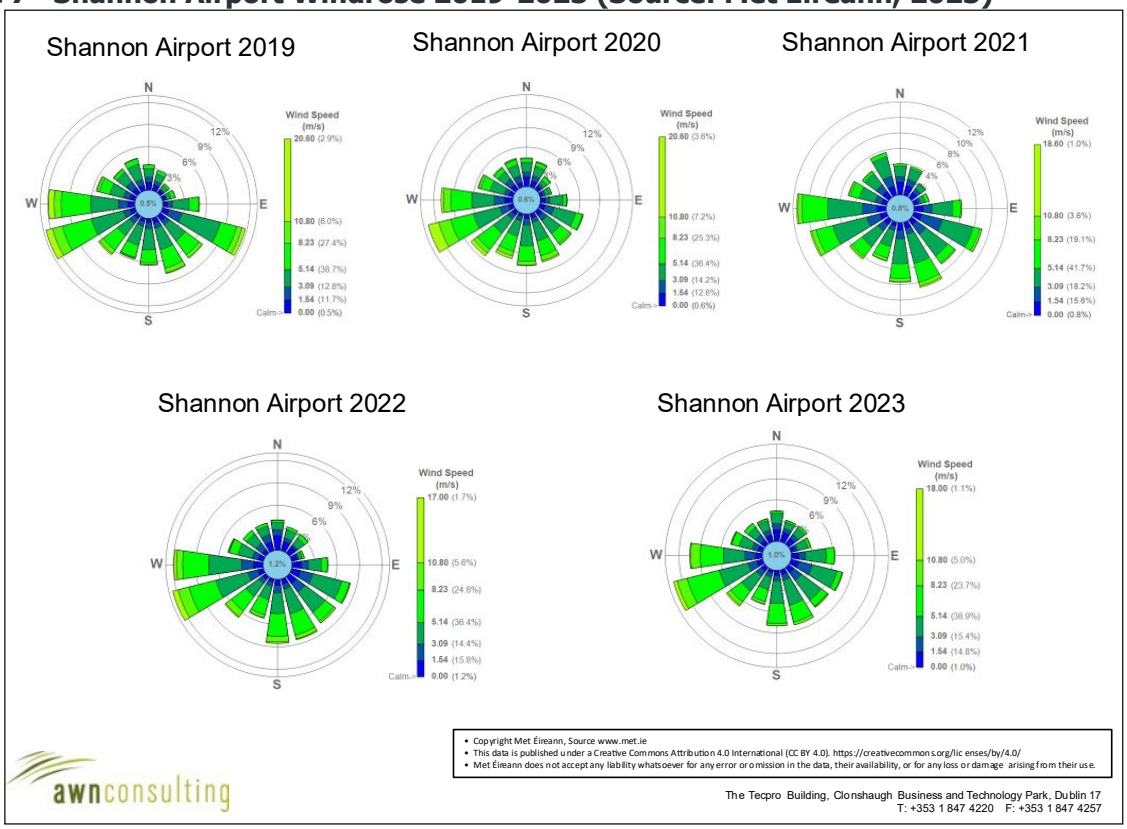
6.3 Baseline Environment

6.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006).

The nearest representative weather station collating detailed weather records is Shannon Airport meteorological station, which is located approximately 19 km north-west of the site of the site. Shannon Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 8). For data collated during five representative years (2019 – 2023), the predominant wind direction is westerly to south-westerly with a mean wind speed of 4.7 m/s over the 30-year period 1991–- 2020 (Met Éireann, 2023).

Figure 7 Shannon Airport Windrose 2019-2023 (Source: Met Éireann, 2023)



6.3.2 Sensitivity of the Receiving Environment

6.3.2.1 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 are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, for example schools and hospitals.

In terms of receptor sensitivity to dust soiling, there are between 1 – 10 high sensitivity residential properties within 100 m of the site boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered **low** based on the IAQM criteria outlined in Table 10.

Table 10 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

Source (IAQM, 2024) Guidance on the Assessment of Dust from Demolition and Construction

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 effects. 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.

Long-term $PM_{2.5}$ monitoring was carried out at the Zone C suburban background locations of Carlow and Ennis which are considered representative of the area of the proposed development for the period 2018 – 2022 (EPA, 2023b). The $PM_{2.5}$ annual average in 2022 for suburban background locations Carlow and Ennis ranged from 7 µg/m^3 to 16 µg/m^3.

A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the Proposed Development is 16 µg/m^3 , as derived from these long-term trends, and there are between 1 – 10 high sensitivity residential properties within 100 m of the site boundary along the R526 Road, the worst-case sensitivity of the area to human health is considered **low**.

Table 11 Sensitivity of the Area to Dust Related Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<250
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

Source IAQM, 2024) Guidance on the Assessment of Dust from Demolition and Construction

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological effects. 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 50m from the site and 50m from site access roads, up to 250m 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 designated habitat sites within 50m away from the Proposed Development which is the area of potential impact as per IAQM guidelines (IAQM, 2024). There are, therefore, no potential effects on ecology from construction dust due to the Proposed Development.

6.3.2.2 Operational Phase

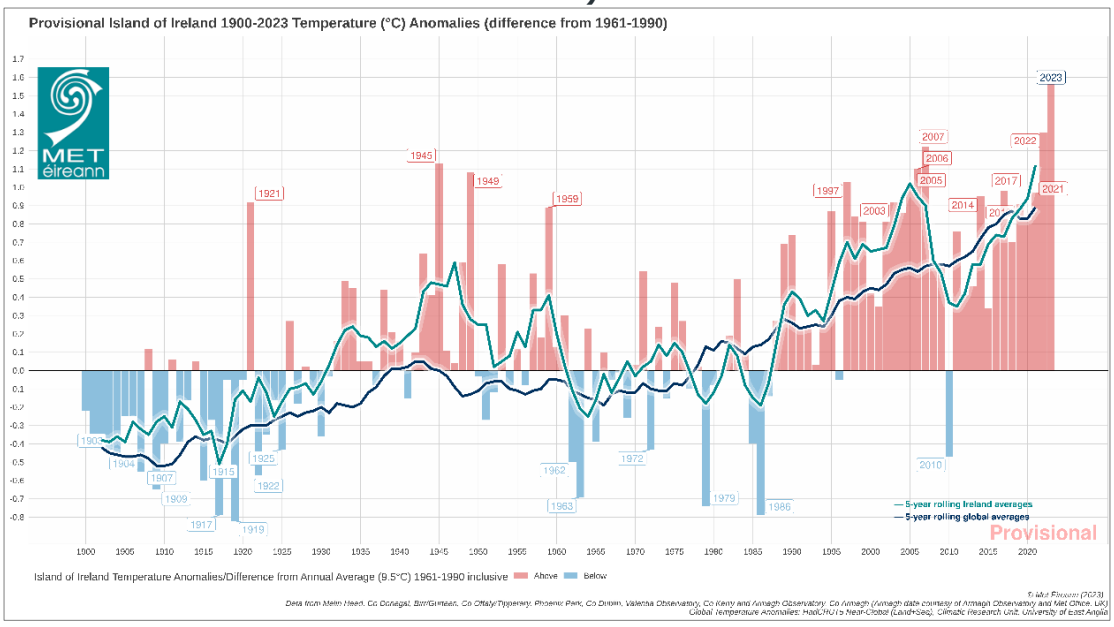
The nearest sensitive receptors with potential to be affected by operational emissions are the residential dwellings located immediately west of the site. However, as the operational phase of the Proposed Development does not include for any main emission sources or result in a material increase in traffic volumes, air quality modelling is not considered necessary to assess potential impacts.

6.3.3 Climate 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 Shannon Airport is the nearest 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 Shannon Airport meteorological station is representative of the current climate in the region of the Proposed Development. The data for the 30-year period from 1991 to 2020 (Met Éireann, 2023a) indicates that the wettest months at Shannon Airport Station were November- January, and the driest month on average was April. July was the warmest month with a mean temperature of 19.5 Celsius. January was the coldest month with a mean temperature of 8.9 Celsius.

Met Éireann's 2023 Climate Statement (Met Éireann, 2023a) states 2023's average shaded air temperature in Ireland is provisionally 11.20 °C, which is 1.65°C above the 1961-1990 long-term average. Previous to this 2022 was the warmest year on record, however 2023 was 0.38 °C warmer (see Figure 9).

Figure 8 1900-2023 Temperature (°C) Temperature Anomalies (Differences from 1961-1990)



2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Recent weather patterns and records of extreme weather events recorded by Met Éireann have been reviewed. Considering the extraordinary 2023 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.

6.3.4 Future Climate 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 including in the region where the Proposed Development will be located (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, 2021a):

- 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.

6.4 Impact Assessment

6.4.1 Construction Phase

6.4.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Shannon Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (see Section 6.3.1). 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 Shannon Airport meteorological station indicates that on average 223 days per year have rainfall over 0.2 mm (Met Éireann, 2023) and therefore it can be determined that 61% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 6.3.2). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

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

Demolition

There is no demolition required as part of the Proposed Development therefore this category is not relevant to the assessment.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area > 110,000m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 6m in height;
- **Medium:** Total site area 18,000m^2 – 110,000m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height;
- **Small:** Total site area < 18,000m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 3m in height.

The dust emission magnitude for the proposed earthwork activities can be classified as **medium** as the total site area for the Proposed Development is 5.52 ha, approximately 55,200 m^2.

The sensitivity of the area, as determined in Section 6.3.2, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. Combining the medium dust emission magnitude with a low sensitivity to dust soiling and low sensitivity to human health impacts results in a **low risk** of dust soiling impacts and a low risk of dust-related human health impacts. This is as a result of the proposed earthworks activities in the absence of standard mitigation.

Table 12 Criteria for Rating Risk of Dust Impacts – Earthworks (IAQM, 2024)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 13 Risk of Dust Impacts – Earthworks

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large**: Total building volume > 75,000 m^3, on-site concrete batching, sandblasting;
- **Medium:** Total building volume 12,000m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- **Small:** Total building volume < 12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as **small** as the total building volume is approximately 10,500 m^3. As outlined in Table 14 and Table 15, combining the large dust emission magnitude with a low sensitivity to dust soiling and low sensitivity to human health impacts results in negligible risk of dust soiling impacts and a negligible risk of dust-related human health impacts. This is as a result of the proposed construction activities in the absence of mitigation.

Table 14 Criteria for Rating of Risk of Dust Impacts – Construction (IAQM, 2024)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 15 Risk of Dust Impacts – Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust-Related Impacts
Dust Soiling	Low	Small	Negligible
Human Health	Low		Negligible

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from track out can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100m;
- **Medium:** 20 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- **Small:** < 20 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as **medium**, as at worst-case peak periods there will be up to 40 outward HGV movements per day. As outlined in Table 16 and Table 17, combining the large dust emission magnitude with a low sensitivity to dust soiling and low sensitivity to human health impacts results in an overall low risk of dust soiling impacts and a low risk of dust-related human health impacts. This is as a result of the proposed trackout activities in the absence of standard mitigation.

Table 16 Criteria for Rating of Risk of Dust Impacts – Trackout (IAQM, 2024)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 17 Risk of Dust Impacts – Trackout

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Trackout	Risk of Dust-Related Impacts
Dust Soiling	Low	Medium	Low Risk
Human Health	Low		Low Risk

Summary of Dust Emission Risks

The risk of dust impacts as a result of the Proposed Development are summarised in Table 18 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a low risk of dust soiling and at most a low-risk human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of standard mitigation, dust impacts are predicted to be *direct, short-term, negative* and ***slight***, which is overall not significant in EIA terms.

Table 18 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	N/A	Medium	Small	Medium
Dust Soiling Risk	N/A	Low Risk	Negligible	Low Risk
Human Health Risk	N/A	Low Risk	Negligible	Low Risk

6.4.1.1.1 Construction Traffic Assessment

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 as described in Section 6.2.

It can therefore be determined that the construction stage traffic will have a ***direct, short-term, negative*** and ***imperceptible*** impact on air quality, which is overall not significant in EIA terms.

6.4.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. However, it is unlikely that site traffic and plant will have any significant impacts on climate. The impact of Proposed Development construction works is deemed to be ***imperceptible, negative*** and ***short term***.

6.4.2 Operational Phase

6.4.2.1 Air Quality

Once operational, the Proposed Development will not introduce any significant emission sources that could adversely affect air quality. To ensure uninterrupted functionality of the network control and protection systems, a diesel generator will be installed to provide emergency standby and auxiliary power in the event of a failure or loss of the low-voltage mains supply. The generator will operate solely during power outages and will automatically shut down upon restoration of mains power. Given its limited and infrequent use, the generator is not considered a primary emission source and is expected to have a negligible impact on the surrounding environment.

In terms of operational traffic emissions, there will be approximately 6 vehicle movements a week on average, resulting in a negligible change to the existing baseline.

Despite the minor operational emissions associated with the Proposed Development, the construction of substations including the proposed development will facilitate the access and implementation of decarbonized electricity and achievement of key ESB Networks' Net Zero objectives of and Ireland's climate related policies and targets. These targets are part of the ESB Networks' Strategic Objectives[16] and include, but are not limited to:

- Decarbonised electricity
  - "Our commitment to working alongside customers and communities, supporting them to achieve Net Zero.
  - "Our core purpose is to provide universal, affordable access to secure and sustainable electricity to all customers.
  - "As the electricity system transitions towards a smarter, sustainable model, the operation and management of these new resources will require a digital network that is flexible and smart. Our core purpose is to provide universal, affordable access to secure and sustainable electricity to all customers.
- Resilient infrastructure
  - "The transition to a low carbon future powered by clean electricity requires a network that is resilient to the impacts of climate change and disruptive events such as storms and cyber threats."
  - "It also recognises we need to build capacity to connect the renewable generation to our network that will generate the clean electricity."
  - "In addition, we need to provide network capacity for the demand associated with significant population growth, new housing developments, economic growth, as well as a significant increase in demand due to electrification of heat, transport and industry."

Overall, considered its negligible operational emissions, and given that the operations of the Proposed Development will facilitate the access and implementation of decarbonized electricity, it is anticipated that the Proposed Development will have a ***neutral*** to ***positive, imperceptible*** and ***long-term*** impact on air quality.

6.4.2.2 Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development.

Greenhouse gas emissions during operation will be limited to the occasional operation of the stand-by generator and to the traffic emissions from the 6 vehicle movements a week. Both emission sources will represent a negligible impact on climate.

As outlined the above Section 6.4.2.1, considered its negligible operational emissions, and given that the operations of the Proposed Development will facilitate the access and implementation of decarbonized electricity, it is anticipated that the impact on Climate will be ***neutral*** to ***positive, imperceptible*** and ***long-term*** during operational phase.

[16] https://www.esbnetworks.ie/about-us/company/our-strategy

6.5 Mitigation Measures

6.5.1 Construction Phase

Best practice construction measures and standard mitigation protocols will be implemented throughout the duration of the construction works, in full compliance with the submitted CEMP (AWN, 2025a). Section 7.2 of the CEMP outlines the overarching strategy for dust suppression and the mitigation of air quality impacts. The proposed standard measures include, but are not limited to:

- Complaint registers will be kept detailing all complaints received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;
- Dust deposition levels will be monitored, if requested by the planning authority, in order to assess the impact that site activities may have on the local ambient air quality;
- Siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance
- A speed restriction of 16km/hr on unsealed roads and 32km/hr on sealed roads will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site;
- Bowsers will be available during periods of dry weather throughout the construction period. Research shown found that the effect of surface watering is to reduce dust emissions by 50%. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface, as required.Any unsurfaced areas will be restricted to essential site traffic only;
- During dry and windy periods, and when there is a likelihood of dust nuisance, watering will be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided;
- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust;
- Where it is expected that overburden / topsoil will need to be stockpiled for some time, these should be seeded to prevent wind whipping. In such cases, the stockpile(s) may need to be watered periodically during dry weather until seed is established.
- Vehicles delivering material with potential for dust emissions to an off-site location will be enclosed or covered at all times to restrict the escape of dust;
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only.
- If required, during construction stages most likely to cause trackout, a wheel wash will be installed within the Site Compound to wash dirt from the Wheels of Trucks exiting the site; and

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

For further information on the proposed mitigation measures please refer to the submitted CEMP (AWN, 2025a) and to the Summary of mitigation and monitoring measures included as Appendix B.

6.5.2 Operational Phase

No mitigation is proposed for the operation phase of the Proposed Development as it is predicted to have an imperceptible impact on air quality and climate.

6.6 Residual Impact

6.6.1 Construction Phase

The implementation of the mitigation measures outlined in the CEMP (AWN, 2025a), also included in Appendix B, during the construction phase will ensure that the residual impacts on air quality and climate are no greater than ***negative, imperceptible and short-term***.

6.6.2 Operational Phase

As no mitigation measures are deemed required for the operational phase of the Proposed Development, the residual impact will remain ***neutral*** to ***positive, imperceptible*** and ***long-term*** for both air quality and climate.

6.7 Cumulative Impact

6.7.1 Construction Phase

Taking into account the implementation of the outlined standard mitigation measures during construction, the Proposed Development is expected to have an imperceptible impact on air quality and climate, with no significant cumulative effects on surrounding developments. Mitigation measures have also been integrated into the design of each permitted development, which will be required to comply with their respective planning conditions and emission limits during construction phase.

Accordingly, it is concluded that in the event of simultaneous construction happening no significant effects between the Proposed Development and committed/ permitted developments will occur with respect to air quality and climate.

6.7.2 Operational Phase

Once operational, the Proposed Development will not introduce any main emission points that could cumulate with committed/permitted developments. Therefore, it is concluded that there will be no potential for cumulative operational impacts in respect of air quality and climate.

7. NOISE AND VIBRATION

7.1 Introduction

AWN Consulting Limited has been commissioned to prepare a noise assessment of the proposed Ballycummin 110kV Substation development. The site is located within the Raheen Business Park, Limerick.

The proposal comprises Gas Insulated Switchgear substation, associated and ancillary outdoor electrical equipment and other apparatus, including installation of underground cables, and site development works including provision of access roads, car parking area, lighting, telecommunications, fencing, landscaping, site services including drainage and all other ancillary works.

The following methodology is proposed for this assessment:

- Outline appropriate construction noise limits and present an indicative assessment of construction noise impacts;
- Outline relevant operational noise criteria that is appropriate to the Proposed Development characteristics; and
- Comment on expected noise impacts associated with new plant and buildings at the nearest noise sensitive locations.

7.2 Relevant Guidance and Criteria

7.2.1 Noise

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 typically 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 Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes which indicates the following Construction Noise Threshold (CNT) and hours of operation.

These are as follows:

Table 19 Maximum Permissible Noise Levels at the Facade of Dwellings during Construction in accordance with TII

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

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

In order to assist with the interpretation of CNTs, Table 20 includes guidance as to the likely magnitude of effect associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration.

Table 20 Construction Noise Significance Ratings

Predicted Noise Level	DMRB Magnitude of Impact	EPA Mapped Impacts	Determination
Below or equal to baseline noise level	Negligible	Not Significant	Depending on CNT, duration & baseline noise level
Above baseline noise level and below or equal to CNT	Minor	Slight to Moderate Note A	
Above CNT and below or equal to CNT +5dB	Moderate	Moderate to Significant	
Above CNT +5 and below or equal to CNT +15dB	Major	Significant, to Very Significant	
Above +15dB		Very Significant to Profound Note B	

Note A: CNLs at the upper end of this range will result in higher potential impacts, therefore this range is categorised as slight to moderate, acknowledging that values approaching the CNT are greater than slight. In accordance with DMRB, noise levels below the CNT are deemed 'Not Significant.'

Note B: The DMRB does not distinguish beyond a 'Major' impact. For the purposes of distinguishing between a Very Significant and Profound Impact, CNLs exceeding the CNT by +15 dB are categorised as Profound.

The adapted DMRB Noise and Vibration (UKHA 2020) guidance is used to assess the overall significance of construction noise at NSLs across the proposed Project.

7.2.1.1 Construction Traffic

In order to assist with the interpretation of construction traffic noise, Table 3.17 of the DMRB Noise and Vibration (UKHA 2020) (as presented in Table 21) includes guidance as to the likely magnitude of effect associated with changes in traffic noise levels along an existing road.

Table 21 Likely Effect Associated with Change in Traffic Noise Level, Construction Phase

Magnitude of Impact	Increase in Traffic Noise Level (dB)
Negligible	Less than 1.0
Minor	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major	Greater than or equal to 5.0

In accordance with the DMRB Noise and Vibration, construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of effect will occur for a duration exceeding:

- Ten or more days or nights in any 15 consecutive day or nights;
- A total number of days exceeding 40 in any six consecutive months.

7.2.2 Vibration

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

7.2.2.1 Building Damage

British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above.

The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to adopt this lower value. Taking the above into consideration the vibration criteria in Table 22 are recommended.

Further guidance relevant to acceptable vibration within buildings is contained in the following documents:

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

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

Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5288-2 also comments that important buildings which are difficult to repair might require special consideration on a case-by-case basis.

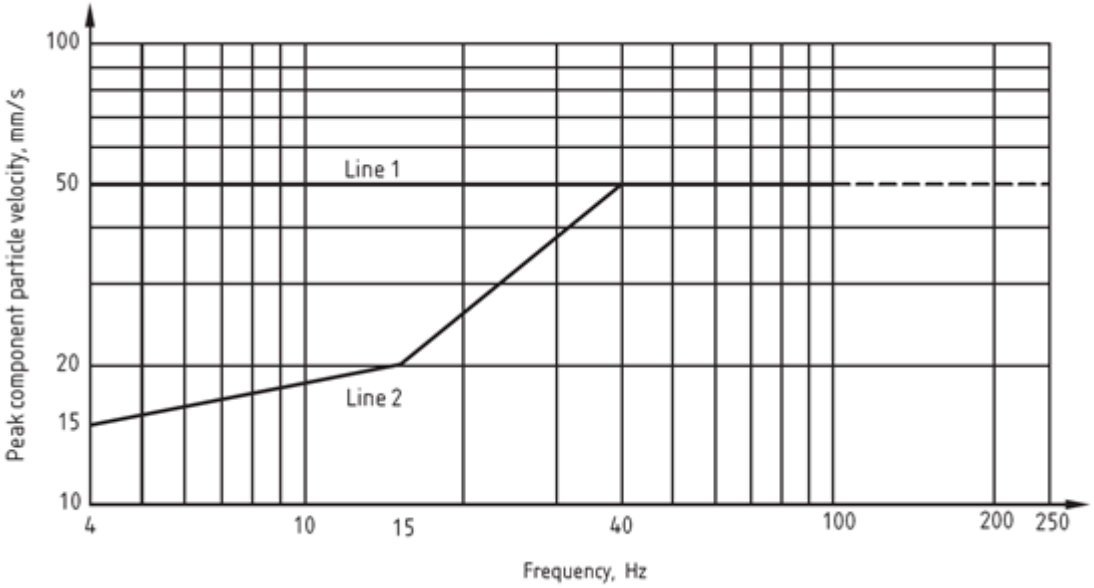
Suggested levels of allowable vibration (in terms of peak particle velocity) at the closest part of a sensitive property to the source of vibration are summarised in Table 22, which outlines the relevant criteria for assessing potential impacts.

Table 22 Transient Vibration Guide Values for Cosmetic Building Damage

Line (see Figure 10)	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4Hz to 15Hz	4Hz to 15Hz
1	Reinforced or framed structures Industrial and heavy commercial buildings.	50 mm/s at 4Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial building types.	15 mm/s at 4Hz increasing to 20 mm/s at 15Hz	15 mm/s at 4Hz increasing to 20 mm/s at 15Hz

Notes:
1) Values referred to are at the base of the building.
2) For Line 2, at frequencies below 4Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.

Figure 9 Transient Vibration Guide Values for Cosmetic Building Damage



The guide values contained in Table 22 relate to predominantly transient vibration which does not give rise to resonant responses in structures, and to low rise buildings.

7.2.2.2 Human Perception

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration, however, are typically tolerated for single events or events of short duration. For example, during piling, one of the primary sources of vibration during construction, vibration levels may typically be tolerated at up to 2.5mm/s. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant to such activities during the night-time.

BS 5228-2 also provides a useful guide relating to the assessment of human response to vibration in terms of the peak particle velocity (PPV). Table 23 below summarises the range of vibration values and the associated potential effects on humans.

Table 23 Guidance on effects of human response to PPV magnitudes

Vibration Level, PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.
10 mm/s	Vibration is likely to be intolerable for any more than a brief exposure to this level

7.3 Operational Phase

7.3.1 Noise - British Standard BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 - *Methods for rating and assessing industrial and commercial sound* describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described

in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate *BS 4142:2014+A1:2019* assessment it is necessary to compare the measured external background sound level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, *BS 4142:2014+A1:2019* advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in *BS 4142:2014+A1:2019* recommends the application of a 2 dB penalty for a tone which is just perceptible at the receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible. In relation to intermittency, *BS 4142:2014+A1:2019* recommends that if the intermittency us readily is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

The following definitions as discussed in *BS 4142:2014+A1:2019* as summarised below:

- ambient sound level, $L_{Aeq,T}$ equivalent continuous. A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.
- residual sound level, $L_{Aeq,T}$ equivalent continuous. A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.
- specific sound level, $L_{Aeq,T}$ equivalent continuous. A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.
- rating level, $L_{Ar,T}$. Specific sound level plus any adjustment for the characteristic features of the sound.
- background sound level, $L_{A90,T}$. A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

In order to establish an initial estimate of impact, *BS 4142:2014+A1:2019* states the following:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level and consider the following.

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The assessment methodology described above, i.e. comparison of rated sound level to background sound level, is quoted in *BS 4142:2014+A1:2019* as representing a methodology to 'obtain an initial estimate' of impact. It is important to note that *BS 4142:2014+A1:2019* also comments that 'Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration'. The

plant noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in *BS 4142:2014+A1:2019* as summarised above.

7.3.2 EPA NG4 Guidance

The proposed development includes an emergency generator which will operate only in the case of emergency or power outage. The specific generator model will be selected and located such that noise emissions during such rare occurrences of temporary duration will be reduced as far as practicable while still performing the essential process.

Section 4.4.1 of the EPA NG4 contains the following comments in relation to emergency plant items:

> *"In some instances, …sites will have certain items of emergency equipment (e.g. standby generators) that will only operate in urgent situations (e.g. grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only.*

If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site". Intermittent testing of the equipment will be undertaken during daytime hours (07:00 – 19:00hrs) so as to result in as minimal impact as practicable on surrounding residential NSLs.

7.3.3 Vibration

Based on the Proposed Development description provided by the Project Team there are no proposed sources of vibration during the operational phase with potential to cause adverse impact outside of the Proposed Development site.

7.4 Existing Noise Levels

7.4.1 Baseline Noise Survey

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with *ISO 1996-1: 2016: Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic Quantities and assessment Procedures*.. Specific details are set out below.

The lands surrounding the Proposed Development site are predominantly industrial in use, with several large industrial facilities located close by, with office space, plant yards, delivery areas and car parking areas associated. At larger distances there are small numbers of dwellings located off the R526 regional road to the west of the site. To the north, there are more numerous dwellings located along Ballycummin Road. These dwellings are approximately 370m and 560m from the proposed site to the west and north, respectively.

Three survey locations were selected to obtain baseline noise levels at these locations for use in the assessment. These are described in the next section.

7.4.1.1 Measurement Locations

The survey measurement locations are described below and illustrated in Figure 11.

- NM1 – located off the R526, representative of two dwellings. Approximately 370 – 420m to the west of the development site.
- NM2 – located off the R526 in front of the hotel located adjacent to the road, approximately 350m northwest of the development site.

- NM3 – located on Raheen Gardens, representative of the rear of houses fronting onto Ballycummin Road further north. Approximately 560m to the northeast of the development site.

Figure 10 Noise Survey Locations

7.4.1.2 Survey Periods

Measurements were conducted over the course of two survey periods as follows:

Daytime

- 11:00hrs to 14:50hrs on 8 August 2025 and;

Night-time

- 23:00hrs on 7 August to 01:40hrs on 8 August 2025.

The weather conditions during the survey periods were as follows:

- Daytime – dry, overcast with intermittent light breeze. Wind speeds <5m/s. Temperature was 18°C.
- Night-time – dry following a period of light rain before the survey. Calm, with winds of less than 3m/s. The temperature was 12°C.

7.4.1.3 Personnel and Instrumentation

AWN Consulting conducted all noise measurements as part of this survey.

The measurements were performed using a RION NL-52 Sound Level Meter. Before and after the survey the measuring instrument was calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

7.4.1.4 Measurement Parameters

The survey results are presented in terms of the following three parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{Amax} is the maximum sound pressure level recorded during the sample period.

L_{AF90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes that the sound levels have been "A-weighted" to account for the non-linear nature of human hearing. The "F" suffix denotes that the parameter has been measured with 'Fast' time-weighting applied.

All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

7.4.1.5 Survey Results

The noise survey results are presented in the following sections.

Location NM1

Table 24 Summary of Attended Measured Noise Levels at Location NM1

Location	Day/Night	Date/Time	Measured Noise Levels, dB		
			L_{Aeq}	L_{Amax}	L_{A90}
NM1	Day	11:23 – 8 Aug	71	80	56
		12:40 – 8 Aug	71	82	57
		13:48 – 8 Aug	72	84	62
	Night	23:44 – 7 Aug	64	82	36
		00:53 – 8 Aug	67	86	35

During the day, the noise environment was dominated by road traffic on the adjacent R526. Distant construction noise, birdsong and light wind-related foliage noise was also reported. During the day, ambient noise levels were in the range of 71 – 72 dB $L_{Aeq,15min}$. Background noise levels were in the range 56 – 62 dB $L_{A90,15min}$.

At night, road traffic was less busy but remained the dominant noise source. Distant traffic noise and low-level plant noise was also noted. Ambient noise levels were in the range 64 – 67 dB $L_{Aeq,15min}$. Background noise levels were in the range 35 – 36 dB $L_{A90,15min}$ at night.

Location NM2

Table 25 Summary of Attended Measured Noise Levels at Location NM2

Location	Day/Night	Date/Time	Measured Noise Levels, dB		
			L_{Aeq}	L_{Amax}	L_{A90}
NM2	Day	11:50 – 8 Aug	71	89	59
		13:00– 8 Aug	71	84	59
		14:12– 8 Aug	72	85	60

Location	Day/Night	Date/Time	Measured Noise Levels, dB		
			L_{Aeq}	L_{Amax}	L_{A90}
	Night	00:04 – 8 Aug	66	87	39
		01:18 – Aug	63	85	38

During the day, the noise environment was dominated by road traffic on the adjacent R526. Distant construction noise, birdsong and activity at a nearby petrol station was also reported. During the day, ambient noise levels were in the range of 71 – 72 dB $L_{Aeq,15min}$. Background noise levels were in the range 59 – 60 dB $L_{A90,15min}$.

At night, road traffic was less busy but remained the dominant noise source. Distant traffic noise and noise from an alarm was also noted. Ambient noise levels were in the range 63 – 63 dB $L_{Aeq,15min}$. Background noise levels were in the range 38 – 39 dB $L_{A90,15min}$ at night.

Location NM3

Table 26 Summary of Attended Measured Noise Levels at Location NM3

Location	Day/Night	Date/Time	Measured Noise Levels, dB		
			L_{Aeq}	L_{Amax}	L_{A90}
NM3	Day	12:15 – 8 Aug	55	79	50
		13:23 – 8 Aug	54	65	50
		14:35 – 8 Aug	58	75	50
	Night	23:17 - 7 Aug	47	62	43
		00:29 – 8 Aug	55	78	43

During the day, the noise environment was dominated by road traffic on the adjacent road. Distant construction noise, birdsong and plant noise from the industrial estate was also reported. During the day, ambient noise levels were in the range of 54 – 58 dB $L_{Aeq,15min}$. Background noise levels were of the order of 50 dB $L_{A90,15min}$.

At night, road traffic was less busy but remained the dominant noise source. Distant traffic noise and noise from an alarm was also noted. Ambient noise levels were in the range 47 – 55 dB $L_{Aeq,15min}$. Background noise levels were of the order of 43 dB $L_{A90,15min}$ at night.

7.5 Potential Impacts of the Proposed Development

7.5.1 Construction Phase

7.5.1.1 Noise

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the Proposed Development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed main construction hours are 07:00 to 19:00hrs on Mondays to Fridays and 08:00 to 16:00hrs on Saturdays.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the proximity of sensitive locations to site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

The noise assessment refers to British Standard BS 5228-1:2009+A1:2014 with regard to reference sound power levels for various construction plant and machinery. Table 27 below sets out reference noise levels for the proposed activities, making reference to information contained in BS 5228.

Table 27 Typical Noise Levels associated with Construction Plant Items

Activity	Item of Plant (BS 5228-1 Ref.)	Construction Noise Level at 10m Distance (dB $L_{Aeq,1hr}$)
Sire Clearance & Preparation	Tracked Excavator (C3.24)	74
	Articulated lorry (C11.10)	77
	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68
Mast and Substation Foundations	Tracked Excavator (C3.24)	74
	Mobile Telescopic Crane (C4.39)	77
	Concrete Pump (C3.25)	78
	Poker Vibrator (C4 33)	78
Substation Superstructure	Telescopic Handler (C4.54)	79
	Hand-Held Circular Saw (C4.72)	79
	Diesel Generator (C4.76)	61
	Internal Fit out	70
Mast Assembly and Erection and Conductor/Insulator Installation	Articulated lorry (C11.10)	77
	Hand tools	81
	Mobile Telescopic Crane (C4.39)	77

Table 28 overleaf, presents the predicted daytime noise levels for an indicative construction period on site. Construction noise sources are assumed to be running 66% of the time.

The area surrounding the Proposed Development is populated with industrial sheds and warehouses, manufacturing buildings, delivery yards and car parking areas. These locations are generally noise producing environments and are not by their nature noise sensitive. Review of the Proposed Development plans indicates there are no areas where works are proposed in close proximity to neighbouring buildings. As such, the noise assessment focuses on determining whether adverse impact on residential properties is expected or not.

The predictions have been prepared for a set of the nearest residential noise-sensitive locations to the site:

- NSL1 which represents houses and apartments approximately 70m west of a proposed mast location and approximately 400m from the substation compound area.
- NSL2 which represents houses and apartments approximately 120m northwest of a proposed mast location and approximately 350m from the substation compound area.

Other residential NSLs are well removed and located in excess of 200m from other areas of proposed works. Predicted construction noise levels at set back distances are listed in the table below.

Figure 11 Residential Noise Sensitive Locations – Construction Phase

Table 28 Predicted Sound Pressure Levels at Distance from Works

Construction Phase	Item of Plant (BS 5228-1 Ref)	$L_{Aeq,12hr}$ at distance (metres)			
		50m	70m	100m	200m
Site Clearance & Preparation	Tracked Excavator (C3.24)	n/a	n/a	n/a	42
	Articulated lorry (C11.10)	n/a	n/a	n/a	45
	Dump Truck (C4.2)	n/a	n/a	n/a	46
	Surfacing (D8.25)	n/a	n/a	n/a	36
Mast and Substation Foundations	Tracked Excavator (C3.24)	56	52	47	42
	Mobile Telescopic Crane (C4.39)	59	55	50	45
	Concrete Pump (C3.25)	60	56	51	46
	Poker Vibrator (C4 33)	60	56	51	46
Substation Superstructure	Telescopic Handler (C4.54)	n/a	n/a	n/a	47
	Hand-Held Circular Saw (C4.72)	n/a	n/a	n/a	47

Construction Phase	Item of Plant (BS 5228-1 Ref)	$L_{Aeq,12hr}$ at distance (metres)			
		50m	70m	100m	200m
	Diesel Generator (C4.76)	n/a	n/a	n/a	29
	Internal Fit out	n/a	n/a	n/a	38
Mast Assembly and Erection and Conductor/Insulator Installation	Articulated lorry (C11.10)	59	55	50	45
	Hand tools	63	59	54	49
	Mobile Telescopic Crane (C4.39)	59	55	50	45

The indicative construction noise prediction values at all representative NSLs are within the criterion of 70 dB $L_{Aeq,1hr}$ for weekdays and the criterion of 65 dB $L_{Aeq,1hr}$ for Saturdays. Due to the large distances between identified areas of construction works, the associated noise levels at the nearest noise sensitive receivers are relatively low.

With reference to Table 20, site clearance works, and substation superstructure works are expected to be ***negative, not significant*** and ***short-term***.

During works on mast sites, predicted noise levels range from negligible to minor in significance. The vast majority of works are categorised as ***negative, slight to moderate*** and ***short-term.***

The effect on the noise environment due to construction activities will be transient in nature and good practice noise reduction measures will be implemented to minimise the effect of construction activities on the surroundings.

7.5.1.2 Construction Traffic

Construction traffic flows have been detailed in the Construction Methodology document prepared for the project. Total tallies per phase have been estimated to reflect 5 no. two-way trips per hour during daytime hours. No night-time movements are forecast.

This magnitude of vehicle movements in the context of the surrounding industrial estate environment is not expected to represent a large increase in the total number of vehicle movements on surrounding roads.

On the basis that a 25% increase in traffic flow is needed to produce +1 dB of noise and taking into account the large separation distances to the nearest NSLs, noise resulting from the construction phase is expected to have a ***negative, not significant*** and ***short-term*** effect.

7.5.1.3 Vibration

It is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that the closest residential properties are from the works and the attenuation of vibration levels over distance, the resultant vibration levels are expected to be well below a level that would cause disturbance to building occupants or even be perceptible. The associated impact is therefore categorised as ***negative, imperceptible*** and ***short-term***.

Any construction activities undertaken on the site will be required to operate below the recommended vibration threshold set out in Table 22 and Table 23 during all activities.

7.5.2 Operational Phase

7.5.2.1 Plant Noise

There are several items of plant with the potential to emit noise during the operational phase of the Proposed Development.

The 2 no. substation buildings will house electrical infrastructure which typically is not associated with notable noise emissions. The 110kV building will comprise metal insulated panel wall and roof construction. The 38kV building will comprise blockwork walls and cement slate roof.

External noise sources are limited to 2 no. 110/38 kV transformers and 2 no. 38/20 kV transformers, located between the substation buildings in the centre of the development site.

Noise data for the proposed external transformers has been supplied by the Project Team and has been input into the 3D noise model.

Table 29 Acoustic Data - Transformers

Transformer	Sound Power Level, dB(Z)								Overall Sound Power Level dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
31.5 MVA 110/20 kV DSO	49	71	69	47	42	34	33	30	62

The proposed development will also include an emergency generator the operation of which will be rare and of very limited duration. Operation of this equipment is discussed in Section 7.3.2. Intermittent testing will take place during daytime hours in order to reduce disruption as far as practicably possible.

7.5.2.2 Noise Model

Proprietary noise calculation software was used for the purposes of this impact assessment. The selected software, DGMR iNoise Enterprise, calculates noise levels in accordance with ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors*, (ISO, 2024).

7.5.2.3 BS 4142 Assessment

7.5.2.3.1 Derivation of Specific Noise Level

Specific plant noise levels have been determined through noise modelling and supplied acoustic data, as presented in Section 7.5.2.1.

Table 30 Calculated Specific Plant Noise Levels

Period	Operating Plant	Predicted Sound Pressure Level , dB		
		NM1	NM2	NM3
Day	110/38 kV transformer (2 no.)	<5	<5	<5
	38/20 kV transformer (2 no.)			
Night	110/38 kV transformer (2 no.)	<5	<5	<5
	38/20 kV transformer (2 no.)			

Based on the relatively low reported sound power levels, the contribution of noise from the transformers operation is negligible at the model receptors that represent noise sensitive locations surrounding the Proposed Development.

7.5.2.3.2 Rating Noise Level

The *rating noise level* is derived by applying adjustments to the specific noise level for tonality, impulsivity and intermittency. Items of plant will be selected and designed such that no tonal or impulsive noise will be audible at the nearest NSLs. The nature of the plant items means that noise emission should be quite uniform, without being intermittent.

The adjustment is therefore 0 dB and as such, the rating level will equal the specific level.

7.5.2.3.3 Background noise level

The background noise levels vary depending on the time of day. Reference is made to the survey locations and results presented in Section 7.4.1. Table 28 presents the background noise level determined to represent a conservative average of the day and night periods.

Table 31 Summary of Background Noise Levels

Location	Background Noise Level dB $L_{A90,15min}$	
	Daytime	Night-time
NM1 (and surrounding area)	58	35
NM2 (and surrounding area)	59	38
NM3 (and surrounding area)	50	43

7.5.2.3.4 Assessment Level

The assessment procedure for the determination of the assessment level is outlined as follows:

1. determine the specific noise level (Section 0);
2. determine the rating level (Section 7.5.2.3.2);
3. determine the background noise level (Section7.5.2.3.3); and
4. subtract the background noise level from the rating noise level in order to calculate the *assessment* level.

Table 32 below summarises the assessment level derivation.

Table 32 Derivation of Assessment Level

Location	Daytime Assessment Levels		
	Rating Level dB $L_{Ar,1hr}$	Background Noise Level, dB L_{A90}	Assessment Level dB
NM1	<5	58	0
NM2	<5	59	0
NM3	<5	50	0
Location	**Night-time Assessment Levels**		
	Rating Level dB $L_{Ar,15min}$	Background Noise Level, dB L_{A90}	Assessment Level dB
NM1	<5	35	0
NM2	<5	38	0
NM3	<5	43	0

Assessment noise levels at the nearest identified NSLs are significantly below the background noise levels for day and night-time, therefore it is expected that there will be no negative adverse impact because of the operation of the identified plant items. The associated impact is therefore ***neutral, imperceptible*** and ***long-term.***

7.5.2.4 Additional Traffic

It is expected that vehicular traffic associated with the Proposed Development once operational will be limited to periodic supervision and maintenance comprising minimal volumes of vehicle movements. As such there will not be traffic of a magnitude that would substantially increase traffic flows on surrounding roads to the degree required to yield even the smallest increase in noise level; 25% increase in traffic flows typically result in a 1 dB increase in noise level.

Therefore, it is expected there will be no adverse noise impact associated with development traffic during the operational phase. The associated impact is therefore ***neutral, imperceptible*** and ***long-term***.

7.6 Mitigation Measures

7.6.1 Construction Phase

The construction assessment set out in Section 7.5.1 concludes that noise from construction activity will fall under the relevant noise criteria.

Standard best practice noise control measures are presented below for information purposes, the implementation of same will further ameliorate noise generated and prevent unnecessary excessive build-up of noise.

7.6.1.1 Noise Control at Source

- The lifting of bulky items, dropping and loading of materials will be restricted to normal working hours.
- Mobile plant should be switched off when not in use and not left idling.
- For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud.
- For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

7.6.1.2 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

7.6.1.3 Liaison with the Public

A designated complaints contact will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or

where noisy works are expected to operate outside of normal working hours etc., the complaints contact will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

7.7 Cumulative Impacts

7.7.1 Construction Phase

On the basis that the majority of construction works will take place within the substation site footprint, the potential for significant cumulative effects is low, even in the scenario that other construction works are ongoing simultaneously, due to the large separation distances to the nearest NSLs and the industrial and commercial nature of the surroundings and the associated low sensitivity to noise in this area.

7.7.2 Operational Phase

During the operational phase, the predicted noise emissions associated with the Proposed Development are of a negligible magnitude and as such, even when added to existing plant noise prevailing in the area, the cumulative noise level of all emissions will not increase.

Vehicle movements associated with the operation of the Proposed Development are of the order of 1 no. per day and therefore in the context of the surrounding industrial estate, there is no potential for negative cumulative effects.

7.8 Residual Impacts

A noise and vibration assessment has been undertaken to determine the potential for negative noise and vibration impacts associated with the construction and operation of the proposed Ballycummin 110kV substation project.

During the construction phase, works comprise excavation for underground cables, mast construction and construction of substation buildings. The vast majority of works will take place within the Raheen Business Park in areas that are located far from residential sensitive receivers, in an industrial and relatively noisy environment. Noise and vibration impacts associated with construction works are not predicted to cause significant impacts.

During the operational phase, noise modelling of proposed external noise sources indicates that the resultant noise level experienced at the nearest noise sensitive locations is imperceptible and there is not a likelihood of significant noise impacts as a result of this operation. Traffic to and from the development is expected to be limited and far below a magnitude which would cause even a marginal increase in noise level to the surroundings.

8. ARCHAEOLOGICAL & CULTURAL HERITAGE

8.1 Introduction

This section assesses the predicted impacts of the Proposed Development on archaeological, architectural and cultural heritage. The Proposed Development is located in the townland of Ballycummin, Co. Limerick (ITM E. 554801m, N. 652451m; see Figure 13).

8.2 Methodology

8.2.1 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:

8.2.1.1 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 the Department of the Environment, Heritage and Local Government and ESB Networks, 2009.

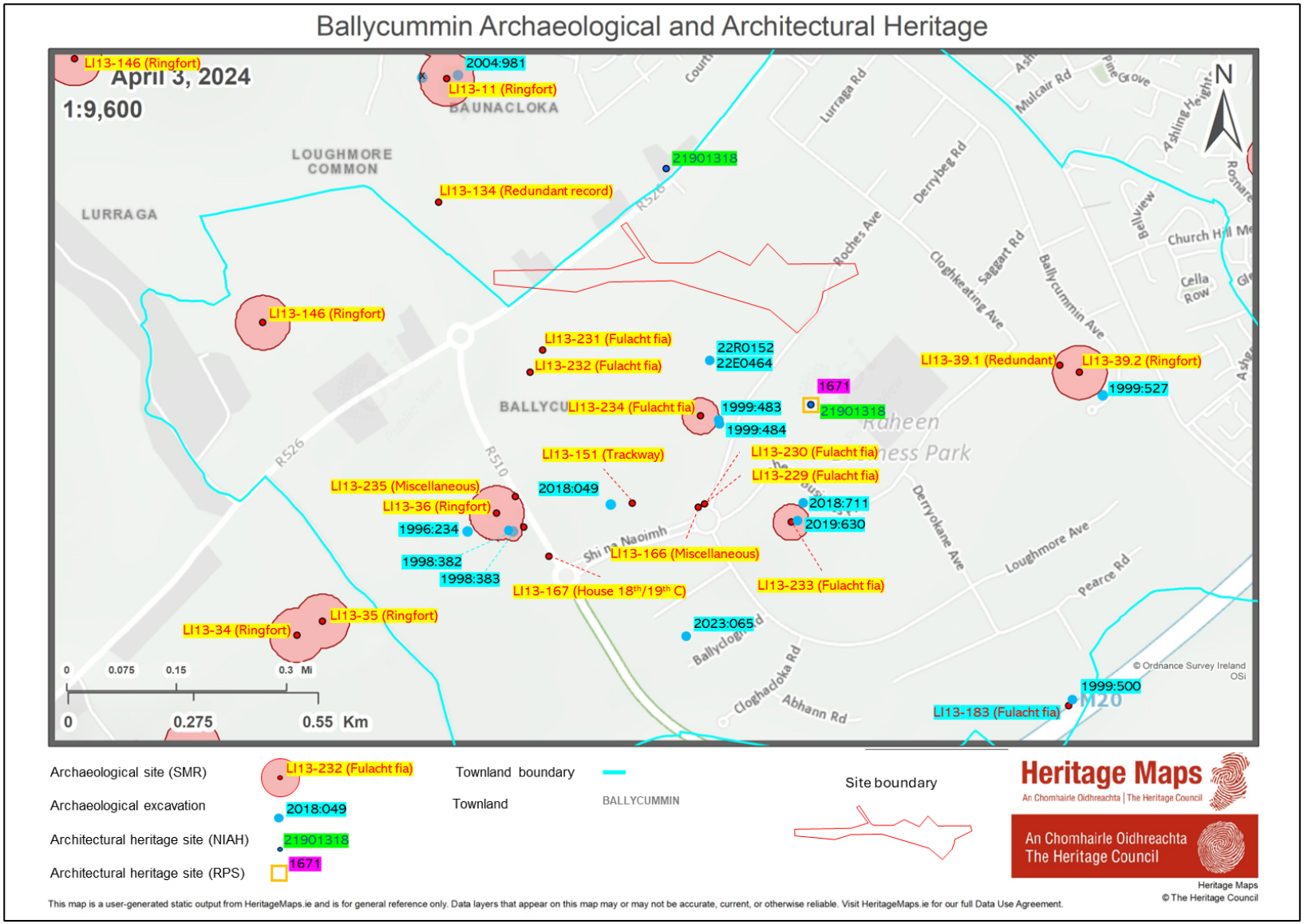
8.2.1.2 The Valletta Convention

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.

No difficulties were encountered during the study.

Figure 12 Site location map showing recorded archaeological and architectural heritage sites in the vicinity of the Proposed Development



8.2.1.3 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.

8.2.1.4 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[17]. 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 Figure 13 and listed in Table 33.

8.2.1.5 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 area. Other published catalogues of prehistoric material were also studied: Iron Age antiquities[18]; bronze swords, Bronze Age hoards and goldwork[19];bronze axes, halberds and daggers[20]. No stray finds were recorded.

8.2.1.6 Recorded Archaeological Excavations

The excavation bulletin website[21] 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 licenced excavations, or which seven uncovered archaeological remains. Summaries of excavations within the study area are detailed in Appendix A (see also Table 34 and Figure 13).

8.2.1.7 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

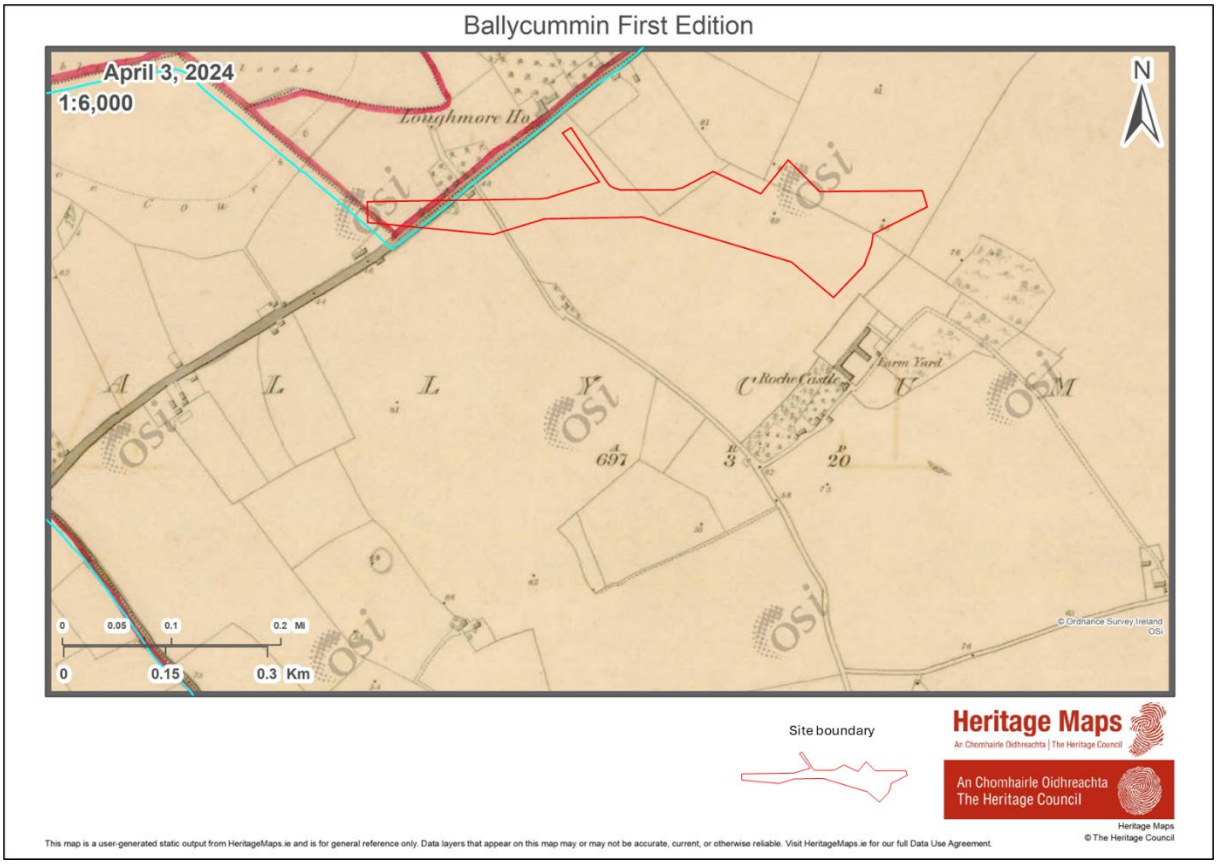
[17] https://archaeology.ie
[18] Raftery, B., 1983. A catalogue of Irish iron age antiquities. Marburg.
[19] Eogan, G. 1965. A catalogue of Irish Bronze swords. Dublin: Stationery Office.; Eogan, G. 1983. Hoards of the Irish Later Bronze Age. Dublin: University College Dublin.; Eogan, G. 1994. The Accomplished Art, Gold and Gold working in Britain and Ireland during the Bronze Age. Oxford: Oxbrow Books.
[20] 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.
[21] https://excavations.ie

the land to be forfeited by the Catholic Irish in order to facilitate its redistribution to Merchant Adventurers and English soldiers[22]. The Down Survey map of the county of Limerick and Barony of Pubblebrien is shown in Figure 14.

Taylor and Skinner - In 1777 George Taylor and Andrew Skinner surveyed and mapped the roads of Ireland and published their results the following year. A second edition of the Maps was printed in 1783. The maps were engraved by Garnet Terry. The strip maps were welcomed for their accuracy and for showing details of roads and crossroads, naming landlords and their houses and outlining topographical features. The map from Limerick to Adare is shown as Figure 15.[23]

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) and second edition 25" (1897-1913)[24] maps were also assessed (see Figure 16).

Figure 16 Extract from the Ordnance Survey c. 1830s First Edition map of Ballycummin



8.2.1.8 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[25]. The Minister for Housing, Local Government and Heritage is currently using the Inventory as the basis for making recommendations for

[22] https://downsurvey.tchpc.tcd.ie/
[23] https://www.swilson.info/tands1777.php
[24] https://heritagemaps.ie
[25] https://archaeology.ie; https://buildingsofireland.ie

the inclusion of structures in the Record of Protected Structures (RPS). Sites within the study area are listed in Table 35 and shown on Figure 13.

8.2.1.9 Aerial Photography

Available online sources for aerial photography were consulted, including the Ordnance Survey and National Monuments Service collections, and images provided by the design team.

8.2.1.10 Historical Research

The baseline historical research utilised sources including Lewis' Topographical Dictionary of Ireland (1837) and local journals.

8.2.1.11 County Development Plan

The Limerick Development Plan 2022 – 2028 was consulted[26]. The plan includes policy objectives for the protection of the county's architectural heritage through their inclusion in the Record of Protected Structures (RPS) or in Architectural Conservation Areas (ACA). The RPS is a list of every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the council's functional area. No structures included in the RPS are located within the footprint of the Proposed Development. There is one site listed in the RPS[27] within the study area, which is also listed in the NIAH (see Figure 13 and Table 35).

8.2.1.12 Recent Archaeological Assessment

A detailed programme of archaeological assessment was undertaken across the site in 2022-23, with respect to a previous phase of development at the site. The assessment comprised geophysical survey (License No. 22R0152), testing (License No. 22E0464), excavation and monitoring (License No. 22E0464 ext.) (see Figure 22).

8.2.1.13 Site walkover survey

A site walkover survey was undertaken on 29 July 2025 in sunny dry weather (see Figure 26).

8.2.2 Introduction

The Proposed Development area is located within the townland of Ballycummin, Co. Limerick (see Figure 13). Ballycummin is in the Electoral Division of Ballycummin, in Civil Parish of Mungret, in the Barony of Pubblebrien, in the County of Limerick.

Ballycummin borders the following other townlands: Baunacloka to the west; Cloghkeating to the west; Derrybeg to the east; Derryknockane to the east; Gouldavoher to the north; Loughmore Common to the west; Lurraga to the west; Roolagh to the south; and Sluggary to the east.

The Irish name for Ballycummin is Baile Choimín. This has been interpreted as meaning the town / homestead of Coimín -- probably a Norman surname (cf. Comyn(s), etc.); the personal name Cuimín should not be discounted[28].

The recorded archaeological and architectural heritage in the study are is listed in Table 33, Table 34 and Table 35 and shown on Figure 13.

[26] https://limerick.ie/council/services/planning-and-placemaking/development-plan-strategies/limerick-development-plan-0
[27] https://limerick.ie/sites/default/files/media/documents/2022-07/3A-Record-of-Protected-Structures-Metropolitan-District-of-Limerick.pdf
[28] https://logainm.ie/en/31178

Table 33 Recorded archaeological sites and monuments within the study area

SMR No	Townland	Monument Class	SMR #
LI013-011	Baunacloka	Ringfort - rath	n/a
LI013-034	Cloghkeating	Ringfort - rath	n/a
LI013-035	Cloghkeating	Ringfort - rath	n/a
LI013-036	Ballycummin	Ringfort - rath	n/a
LI013-039001-	Ballycummin	Redundant record	n/a
LI013-039002-	Ballycummin	Ringfort - rath	n/a
LI013-134	Loughmore Common	Redundant record	n/a
LI013-146	Ballycummin	Ringfort - rath	n/a
LI013-151	Ballycummin	Road - road/trackway	99E0376
LI013-166	Ballycummin	Excavation - miscellaneous	98E0108
LI013-167	Ballycummin	House - 18th/19th century	n/a
LI013-183	Ballycummin	Fulacht fiadh	99E0093
LI013-229	Ballycummin	Fulacht fiadh	98E0433
LI013-230	Ballycummin	Fulacht fiadh	98E0433
LI013-231	Ballycummin	Fulacht fiadh	98E0433
LI013-232	Ballycummin	Fulacht fiadh	98E0433
LI013-233	Ballycummin	Fulacht fiadh	98E0433
LI013-234	Ballycummin	Fulacht fiadh	98E0433
LI013-235	Ballycummin	Excavation - miscellaneous	98E0504

Table 34 Recorded archaeological excavations within the study area

Licence #	Townland	SMR #	Site type
96E379-AR 14	Ballycummin	N/A	Excavation - miscellaneous; undated
98E0108	Ballycummin	LI013-166	Bronze Age (2200 BC-801 BC)
98E0504 ext.	Ballycummin	LI013-235	Prehistoric (12700 BC-AD 400)
98E0433	Ballycummin	LI013-151; 229-234	Fulacht fiadh and Road - road/trackway
99E0376	Ballycummin	LI013-151	Road - road/trackway
99E0093	Derryknockane	LI013-183	Fulacht fiadh
99E0116	Ballycummin	N/A	No archaeology found
04E0196	Baunacloka	LI013-009	No archaeology found
18E0153	Ballycummin	LI013-151	Burnt mounds and post-medieval track
18E0278	Ballycummin	LI013-233	No archaeological significance
18E0278 ext.	Ballycummin	LI013-233	Fulacht fiadh and possible well
22R0152	Ballycummin	LI013-151; 229-234	Geophysics – features identified
22E0464	Ballycummin	LI013-151; 229-234	Testing - fulachat fiadh & pit
22E0464 ext	Ballycummin	LI013-151; 229-234	Monitoring and excavation of features – fulachat fiadh & pit
23E0102	Ballycummin	N/A	No archaeology found

Table 35 Recorded architectural heritage sites within the study area

NIAH Reg. No.	RPS	Original Use	Townland	Date	Categ. of Special Interest
21901309	1671	house	Ballycummin	1820-1840	Architectural, Artistic
21901318	n/a	house	Baunacloka	1820-1840	Architectural

8.2.3 Pre-history (c. 8000 BCE – 400 AD)

The earliest evidence of human habitation in the study area dates to the Bronze Age (c. 2,500BC – 500BC), in the form of fulachta fiadh, of which eight have been uncovered during archaeological investigations in advance of previous developments in the study area, including six within the red line boundary of the Proposed Development. Six of these have been excavated in full in advance of development (see , Table 33 -Table 35 and Appendix A). Of the remaining sites, one is located within the red line boundary of the Proposed Development (SMR No. LI013-234; Excavation No. 1999:483) and one is located c. 100m due south of the Proposed Development lands (SMR No. LI013-233; Excavation No. 1999:483). These were not excavated at the time of discovery as these areas were not being impacted by development; see Figure 13).

Fulacht fiadh or burnt mounds comprise mounds of charcoal rich soil, heat-fractured stones accompanied by a trough sometimes lined with wooden planks, stone slabs or even clay[29]. 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.

8.2.4 Early Medieval Period (c. 400 AD – 1100 AD)

The spread of Christianity from the early fifth century AD marks the transition from the prehistoric to the medieval period. Ireland at this time was predominantly a rural society, with dispersed settlement. During this period, defensive enclosures known as ringforts were constructed to protect farmsteads. These are one of the most frequently recorded archaeological site types and c. 50,000 examples are recorded in the Irish landscape. Ringforts are regarded as defended family homesteads and the dating evidence to date suggests they were primarily built between the seventh and ninth centuries AD[30].

Many ringforts have been partially or completely destroyed since the 1960s and often the only indication of the former presence of a ringfort is preserved in townland name elements such as Dún, Rath, Cashel or Lios. However, monuments which have experienced above-ground disturbance continue to be of archaeological interest due to the potential for subsurface remains to exist at their locations. The term 'enclosure' is applied to monuments that cannot be classified more accurately without archaeological assessment but were identified as enclosures during fieldwork or through the study of aerial photography or other sources.

There are six recorded ringforts within the study area, none of which are within the red line boundary of the prosed development (see Figure 13, Table 33).

Mungret monastery, located just over a kilometre to the north of the Proposed Development, was one of the most important Early Christian monasteries in north Munster. Founded, apparently in the sixth century, by St Nessan its abbots are recorded from the middle of the eighth century, and this provides a clear indication of its significance by this time[31]. The monastery was raided on a number of occasions between the tenth and twelfth centuries.

[29] Waddell, J. 2000. *The prehistoric archaeology of Ireland*. 2nd Edition. Galway: Galway University Press.
[30] Stout, M., 1997. *The Irish Ringfort*. Four Courts Press: Dublin.
[31] Gwynn, A. and Hadcock, R.N., 1970 (Reprint 1988). *Medieval religious houses of Ireland.* Dublin. Irish Academic Press.

8.2.5 Later Medieval Period (c. 1100 AD – 1650 AD)

The Anglo-Norman's arrived in Ireland in 1169, to support the deposed king of Leinster, Diarmuid MacMurchadha. By the end of the twelfth century the Anglo-Normans had succeeded in gaining control over much of the country[32]. The Anglo- Norman tenurial system more or less appropriated the older established land units known as túath in the early medieval period but described the territories as manors[33].

Ballycummin is located in between the important high medieval settlements of Limerick to the northeast and Adare to the southwest. The Anglo-Normans first established a presence in Limerick in 1171 when Donal O'Brien, King of Limerick and Thomond, paid homage to King Henry II at Cashel, and afterwards King Henry II sent 'Keepers' to Cork and Limerick[34]. In 1175, Donal O'Brien, King of Limerick, rebelled against the King of England and Raymond le Gros, the start of many centuries of ongoing conflict between the native Irish and the colonisers.

After the Anglo-Norman invasion, the above mentioned Mungret functioned as an episcopal manor and was granted the right to hold a weekly market in 1225[35]. A rental of the manor, prepared in 1336, survives in the Black Book of Limerick. It states that the burgesses then rendered £4 10s. annually to the bishops for the land they held[36]. Further evidence that the settlement was a borough is provided by an entry in the statute rolls of 3 Edw IV (1463-4) which indicates that the borough had been granted the laws of Breteuil[37]. The subsequent history of the borough is unknown, but it is to be presumed that it shared the same fate as many of the other medieval boroughs in the county by falling prey to the ravages and famines of the mid fourteenth and fifteenth centuries. The medieval borough is likely to have been centred on (and to the north of) the cluster of churches which survive on the south side of the Foynes road. Lewis[38] reports the presence of "extensive foundations of buildings in the adjoining fields, at a considerable depth beneath the surface, and occasionally discovered by the plough."

8.2.6 Post-Medieval Period (c. 1650 AD –)

A 48m long trackway identified during archaeological investigations (LI13-151; Excavation Nos 1999:483 & 2018:049) was subsequently excavated (Excavation No 1999:484) and interpreted as post-medieval in date.

In the mid-seventeenth century, the armies of the English Commonwealth, commanded by Oliver Cromwell, emerged victorious over the royalists, and immediately undertook an ambitious project of social engineering, underpinned by a massive transfer in landownership from Irish Catholics to English Protestants. For this to happen, the land had to be accurately surveyed and mapped, a task overseen by the surgeon-general of the English army, William Petty.

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 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. Copies of these maps have survived in dozens of libraries and archives throughout Ireland and Britain, as well as in the National Library of France[39]. Ballycummin is depicted on the Down Survey Maps for the county (see Figure 14) and is listed being in the ownership of the Protestant Bishop of Limerick in 1641 and 1670,

[32] Stout, G and Stout, M., 1997. *Early landscapes: from prehistory to plantation*. Atlas of the Irish Rural Landscape, Cork University Press, Cork.
[33] MacCotter, P. 2008. *Medieval Ireland: territorial, political and economic divisions*. Dublin: Four Courts Press.
[34] Furnivall, F.J., 1896. *The English Conquest of Ireland A.D. 1166–1185*. London: Kegan Paul, Trench, Trübner & Co.
[35] Sweetman, H.S. (ed.), 1875. *Calendar of documents, relating to Ireland. Vol.i, 1171-1251*. Dublin.
[36] MacCaffrey, J. 1907 *The black book of Limerick*. Dublin.
[37] Berry, H. F. (ed.), 1914. *Statute rolls of the parliament of Ireland 1-12 Edward IV*. Dublin.
[38] Lewis, S. 1837. Topographical Dictionary of Ireland, 2 vols. London: S. Lewis & Co.
[39] http://downsurvey.tcd.ie/

comprising 186 plantation acres of unprofitable land and 318 plantation acres of profitable land, with a population of 28 (26 English and two Irish).

Taylor and Skinner's map 1777 of Limerick to Adare does not depict the townland of Ballycummin, but it shows Mungrett abbey and indicates the significance of the route, which has now been superseded by the M20 (see Figure 15).

The first edition Ordnance Survey map of the townland of Ballycummin, dating to the 1830s, depicts the lands on which the Proposed Development is planned as a series of large fields, presumably in agricultural use (see Figure 16). The notable feature in the landscape is Roche Castle and modest demesne landscape, dating to about this time, which still exists (NIAH No. 21901309; RPS No. 1671; see Figure 13 and Table 35).

Little changes in the intervening century until the issue of the second edition Ordnance Survey, dating to the 1910s (see Figure 16) The smaller fields in the south of the Proposed Development lands have been amalgamated into a single field, and Roche Castle has seen significant expansion.

A 48m-long section of nineteenth-century trackway was discovered during previous archaeological investigations at the site (License No. 99E0376; SMR No. LI013-151); it was interpreted as possibly having been used to ferry stone from a nearby quarry (see Figure 13).

Aerial photography images from 1995 () suggests there were no changes to the landscape in the twentieth century, with the land remaining in agricultural use in open pasture. The 2000 and digital glove aerial photographs (Figure 18) shows the impact of the development of the Proposed Development lands as a business park (Raheen Business Park), as evidenced by the numerous archaeological excavations undertaken around this time (see Table 34 and Appendix A).

Modern aerial photography demonstrates that the vast majority of the Proposed Development lands have been substantially developed in recent years (see Figure 21).

Figure 13 Extract of Down Survey map of the County of Limerick and the Barony of Pubblebrien

Figure 14 Extract of Taylor & Skinner map from Limerick to Adare (1777)

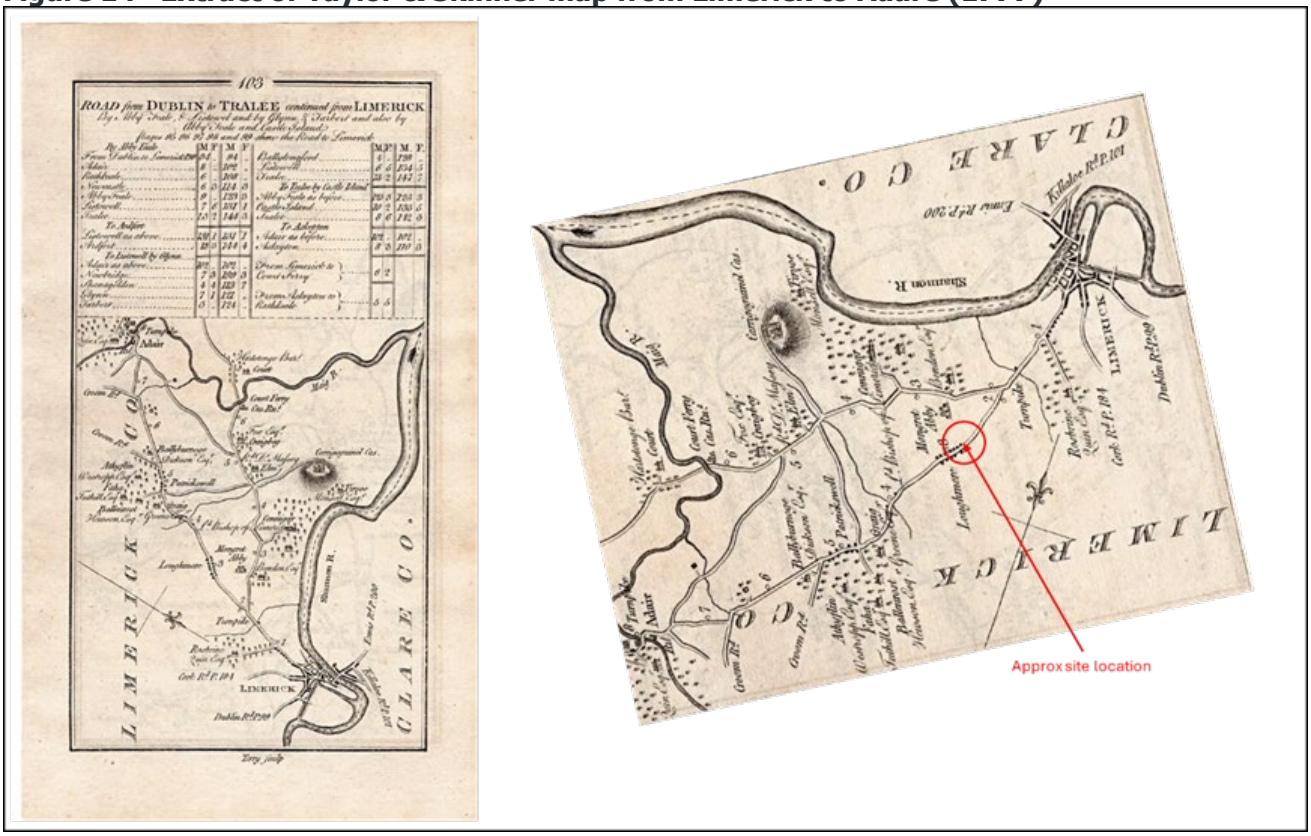


Figure 15 Extract from the Ordnance Survey c. 1830s First Edition map of Ballycummin

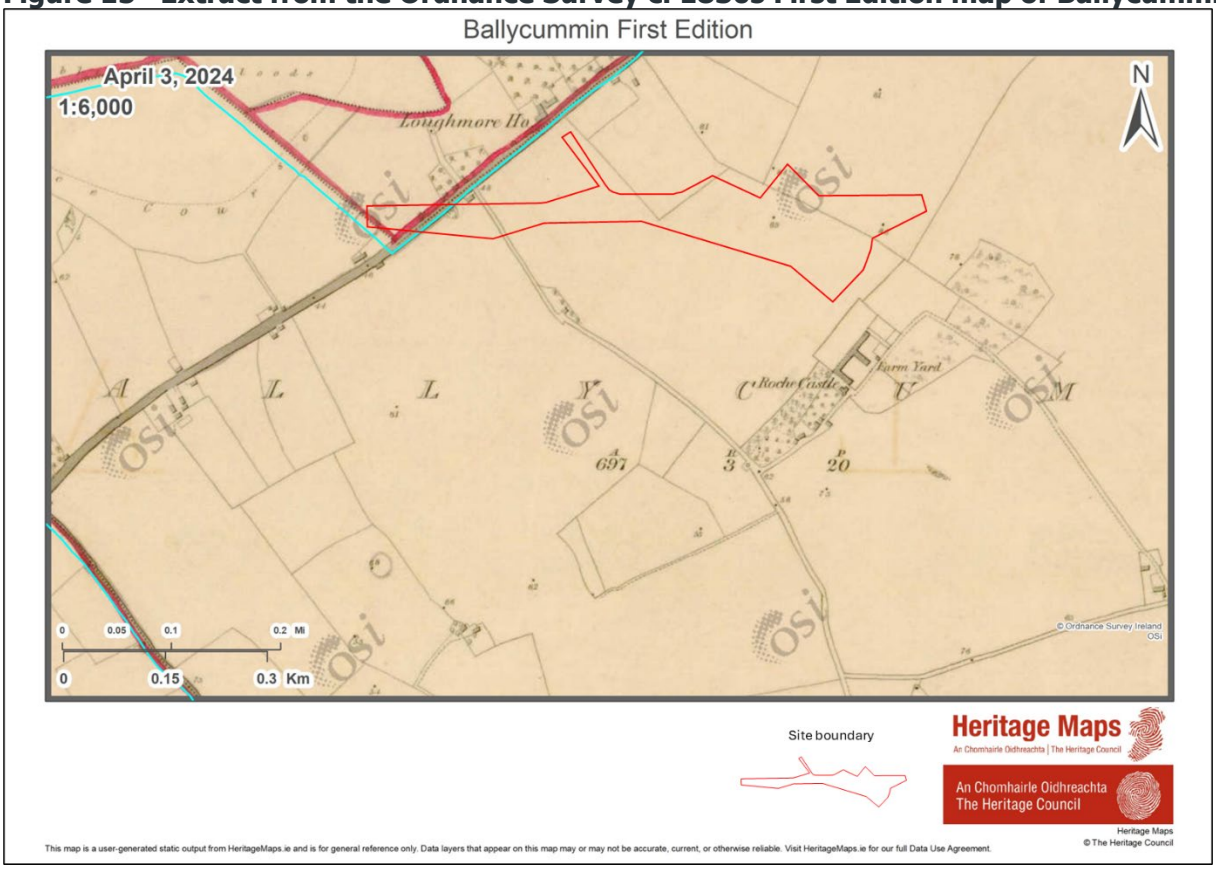


Figure 16 Extract from the Ordnance Survey c. 1910s Second Edition map of Ballycummin

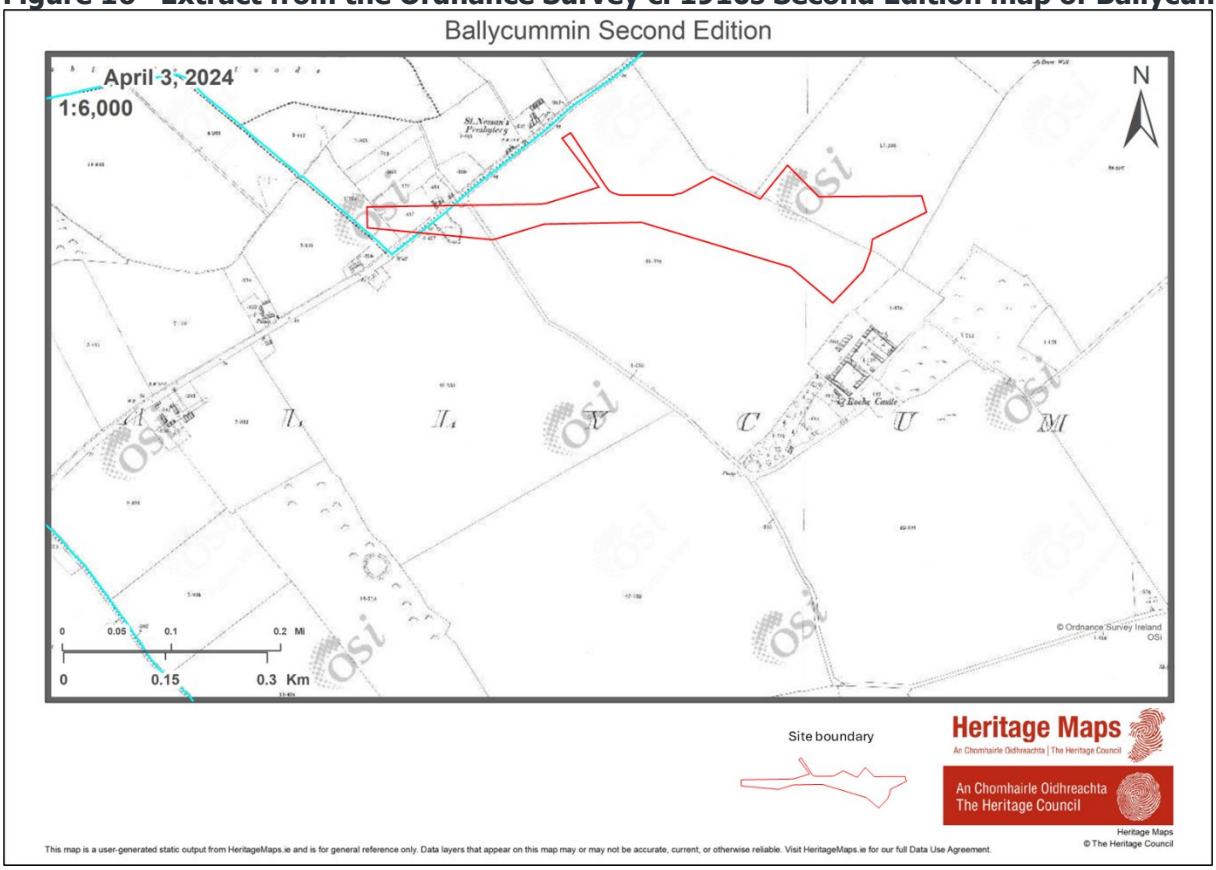


Figure 17 Extract from the Ordnance Survey 1995 Aerial Photograph of Ballycummin

Figure 18 Extract from the Ordnance Survey 2000 Aerial Photograph of Ballycummin

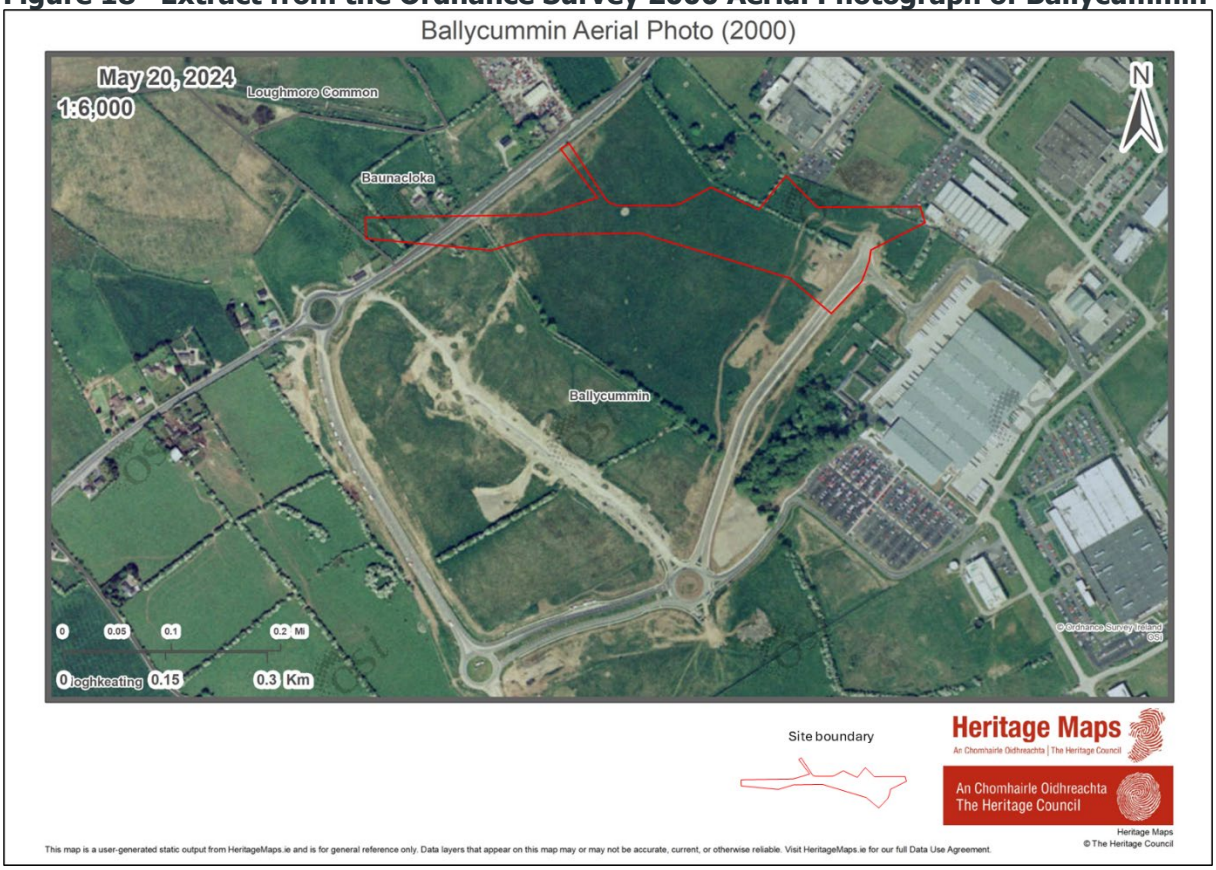


Figure 19 Extract from the Ordnance Survey Digital Globe Edition Aerial Photograph of Ballycummin

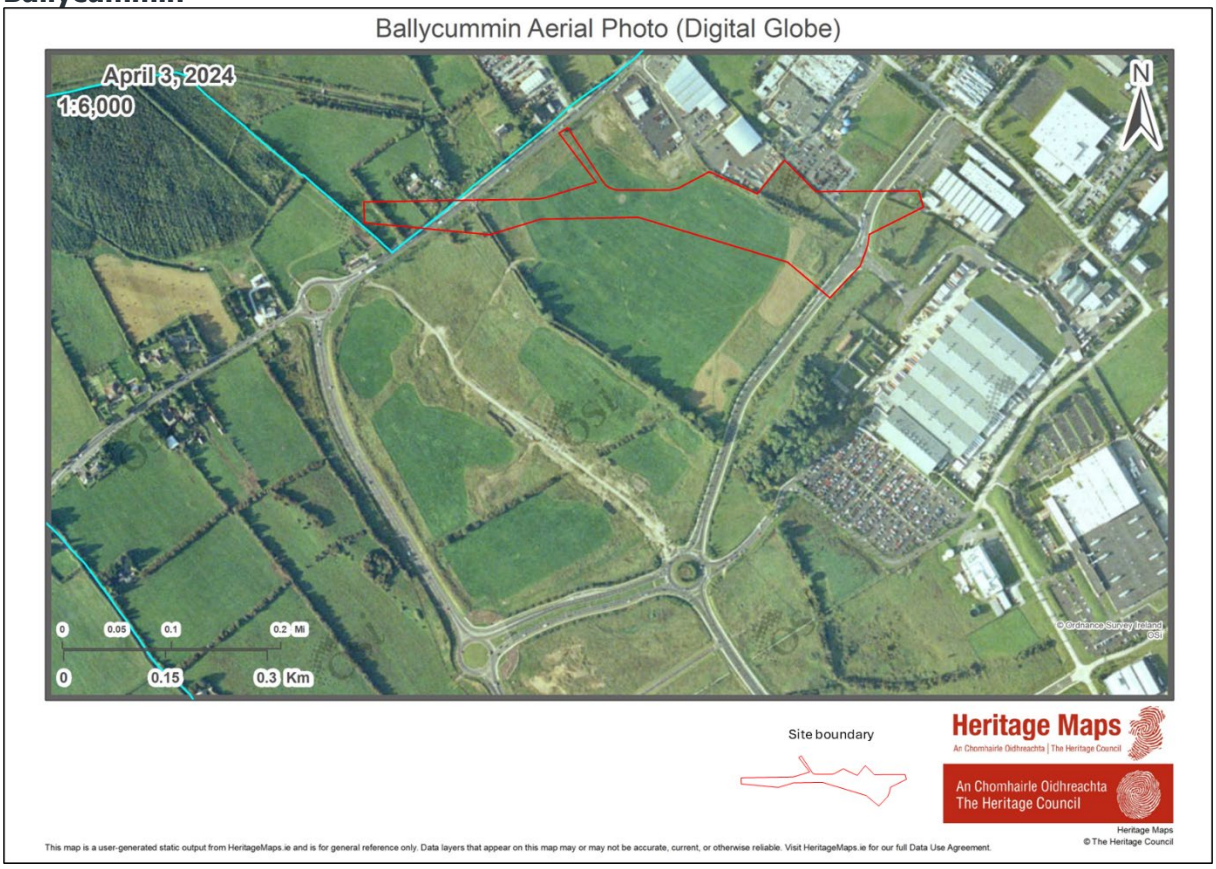
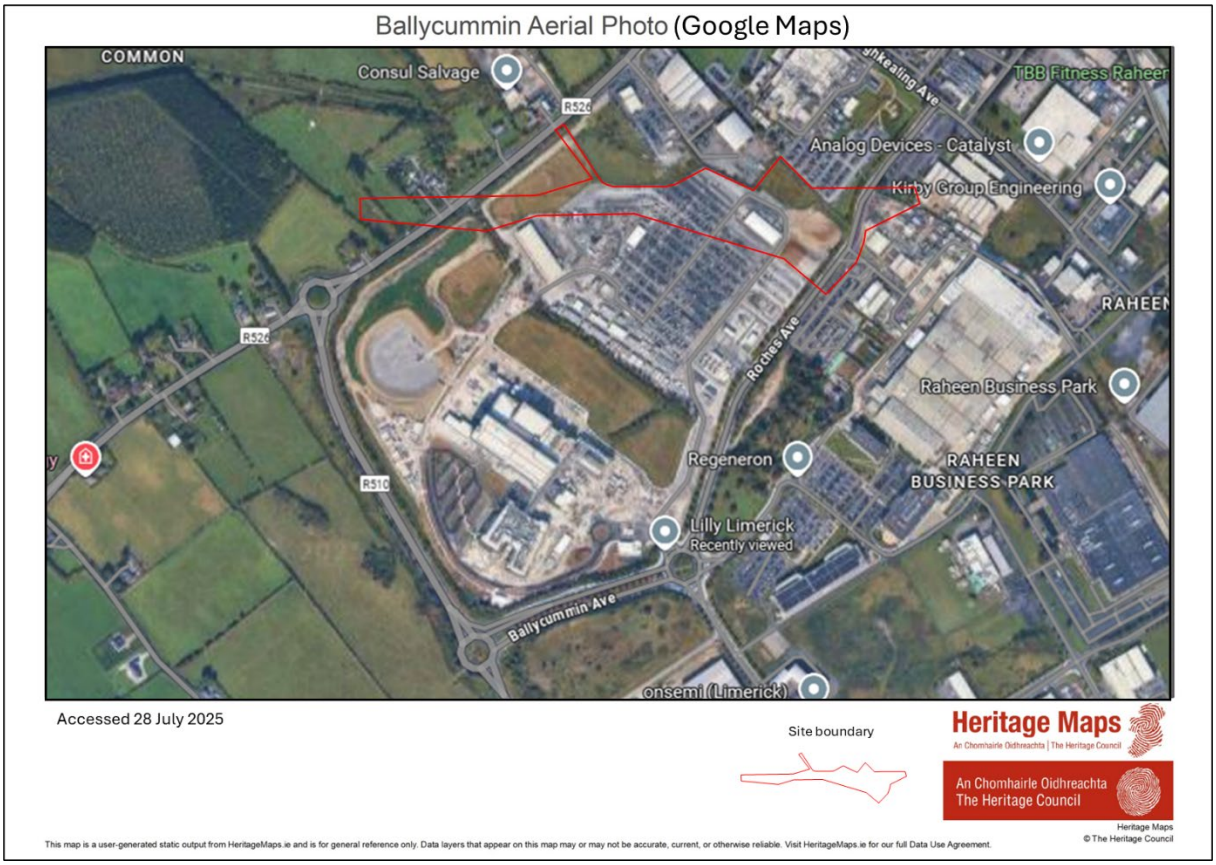


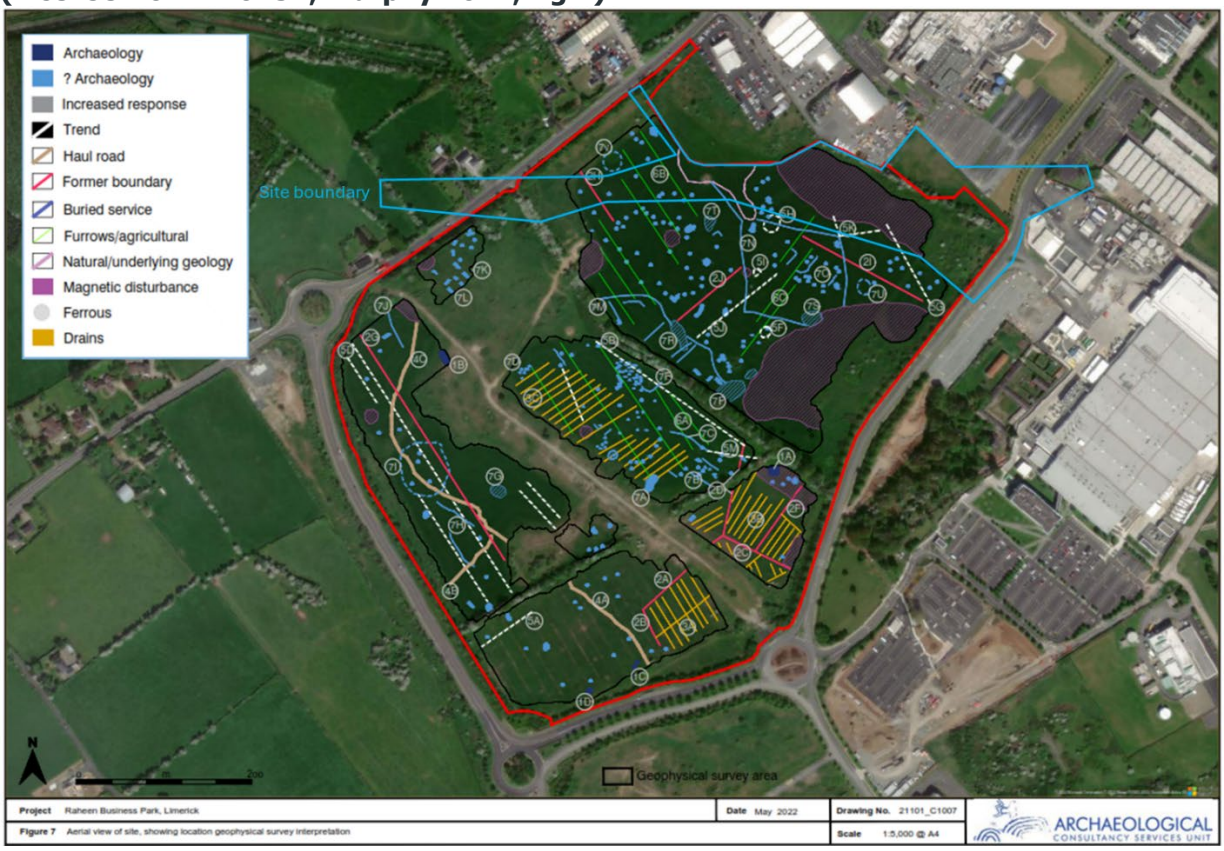
Figure 20 Extract from the Google Maps Aerial Photograph of Ballycummin



8.2.7 Recent Archaeological Assessment

The majority of site of the Proposed Development was subjected to geophysical survey (License No. 22R0152), testing (License No. 22E0464), excavation and monitoring (License No. 22E0464 ext.) with respect to a previous phase of development (see Figure 22).

Figure 21 Results of geophysical survey of the Proposed Development lands in 2022 (License No. 22R0152; Murphy 2022, fig 7)



8.2.7.1 Geophysical Survey

A geophysical survey was undertaken of the entire site with the exception of a small number of areas where ground conditions did not allow for survey (see Figure 22)[40]. The survey was conducted under licence 22R0152 and comprised a full detailed gradiometer survey using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer cart system.

The survey was successful in the identification of archaeological remains on the site; including the location of two monuments (SMR No. LI13-234 (Anomaly 1A) and SMR No. LI13-232 (Anomaly 1B)), both representing fulachta fia. Two areas of archaeological activity identified previously under licence 18E0153 were also located (Anomalies 1D and 1C). An array of positive responses of potential archaeological significance that might be geological or modern in nature were also noted. These include scattered positive responses (possible archaeology) that might represent cut features pits/postholes, large areas and linears (Anomalies 7A-E, 7G, 7H 7J, 7L-7M, 7O-7T) some of which might be spreads, fulachta fiadh or wet areas, the linears might be ditches; concentration of responses might represent possible house site (Anomalies 7F), possible oval/circular anomalies might be remains of enclosures (Anomalies 7I, TV and 7U), others represent curvilinears (Anomalies 7L and 7K), a possible rhomboid enclosure (Anomaly 7N) and meandering response (Anomaly 7M); the latter two might alternatively represent former field access lanes.

[40] Murphy, D., 2022. Report on Geophysical Survey at Ballycummin Avenue, Ballycummin, Co. Limerick. Unpublished report submitted to the National Monuments Service (Detection Device Licence No.: 22R0152).

In addition, linear trends (Anomalies 5A-5G, 5J, 5K) may be field access lanes and faint oval trends (Anomalies 5F, 5H, 5I) may represent ploughed out enclosures; however, these are ephemeral and might also be geological in nature. Furthermore, linears (Anomalies 2A-2F) corresponding with field boundaries depicted on the 1839 map as well as possible ditches that might represent pre ordnance survey boundaries (Anomalies 2G-2J) were noted. Other anomalies included drain systems (Anomalies 3A-3C) and modern anomalies such as former haul roads (Anomalies 4A-4C), agricultural furrows/plough marks (Anomalies 6A-6C) and areas of magnetic disturbances, particularly in the south and northeast portion of Field 6 were noted. Smaller magnetic disturbances correspond with electric posts, and watering areas, one in the north portion of Field 5 corresponds with former structures depicted on the 1839 map.

The geophysical survey report recommended that the site be subject to archaeological test trenching at the pre-construction phase, targeting anomalies identified. A systematic test trenching programme of the areas that were not suitable for geophysical survey was also recommended.

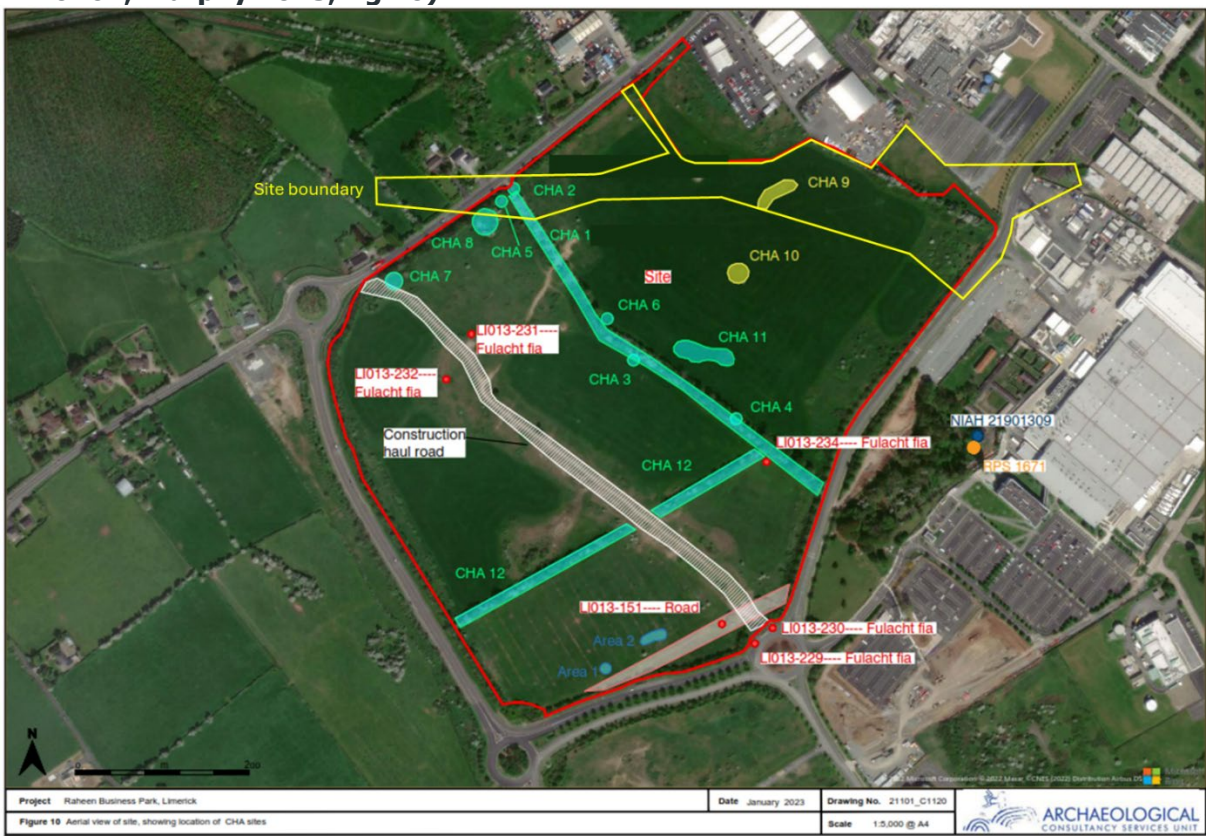
8.2.7.2 Archaeological Test Excavations

The site was subjected to a programme of archaeological test trenching under licence 22E0464 from the National Monuments Service in 2022 (see Figure 23).

Figure 22 Layout of archaeological test trenches undertaken in 2022 (License No. 22E0464; Murphy 2023, fig 9)

Natural undisturbed subsoil was not exposed during the monitoring of the relocation of the protected grasses, and no features of archaeological significance were exposed. Subsequently, 79 test trenches were excavated targeting anomalies identified during the geophysical survey (22R0152), the location of the Cultural Heritage Areas as well as the road/trackway (SMR No. LI13-151). Each trench measured 1.8 m in width, and in total 4,407m of linear trenches were excavated. The test trenches were excavated to the natural subsoil, to a depth of between 0.3m-0.8m.

Figure 23 Summary of results archaeological testing undertaken in 2022 (License No. 22E0464; Murphy 2023, fig 10)



Two archaeological features were identified, a substantially disturbed fulacht fiadh C21 (Area 3) and pit C23 (Area 4). Three test trenches were excavated at the location of a modern 19th-century road/trackway (SMR No. LI13-151), the road was sectioned and drawn. No structures at the location of CHA 5 and CHA 6 were uncovered.

Fulacht fiadh (SMR No. LI13-234) remains were preserved in situ as no groundworks were proposed at this location.

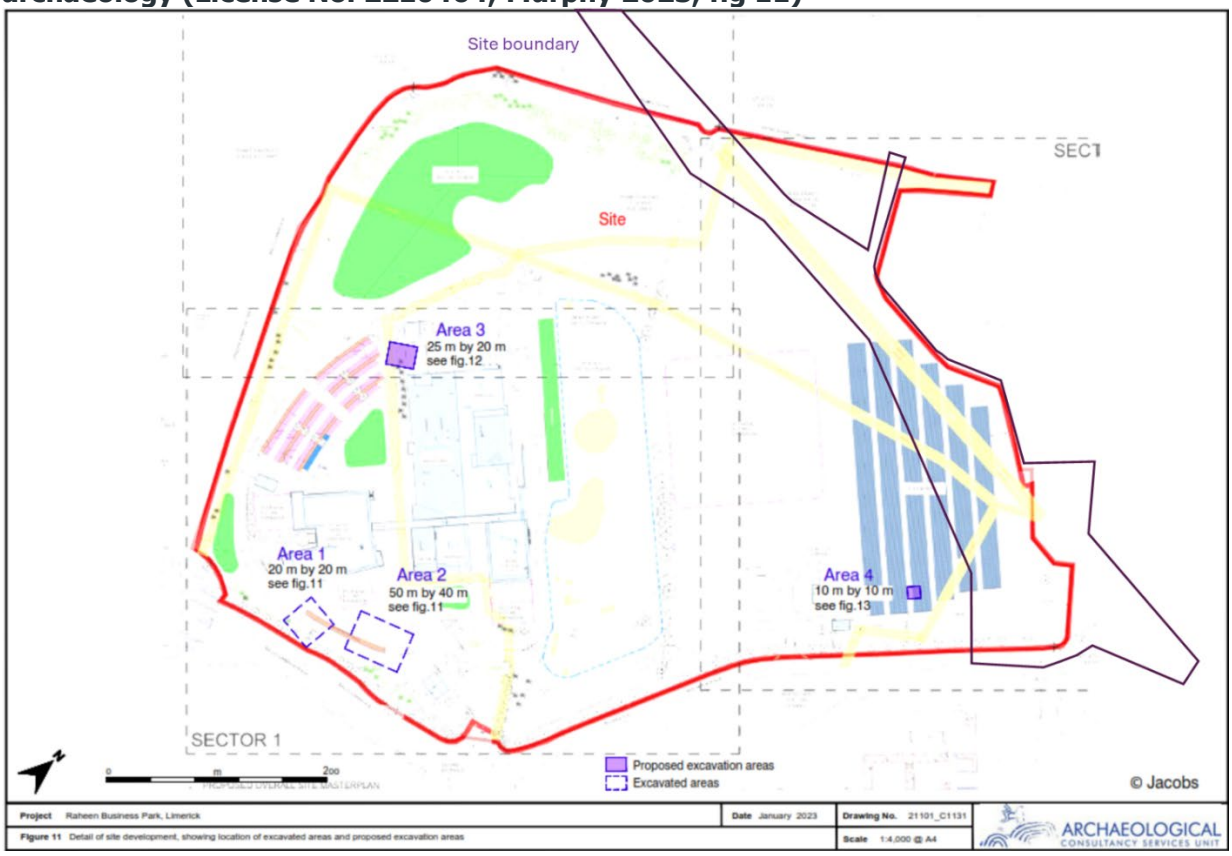
No additional archaeological features were identified.

As the archaeological features identified by the testing were to be directly impacted by the Proposed Development works in 2023, it was recommended that they be preserved by record i.e. fully excavated under license to the National Monuments Service in advance of development:

- an area measuring 25m by 30m at the location of fulacht fiadh C21 (Area 3, 554650, 652370)
- an area measuring 10m by 10m at the location of pit C23 (Area 4, 555113, 652590)

It was further recommended that monitoring of all groundworks associated with the development be carried out.

Figure 24 Summary of results archaeological testing undertaken in 2022 showing areas of archaeology (License No. 22E0464; Murphy 2023, fig 11)



8.2.7.3 Archaeological Excavation and Monitoring

Archaeological excavation of the features identified during geophysics and testing, namely the remains of the fulacht fiadh (Area 3) and the pit (Area 4) was undertaken under an extension to the testing licence (22E0464).

Archaeological monitoring of groundworks associated with the development was also undertaken. No further features of archaeological interest were recorded.

The final report on excavation and monitoring is in progress and will be submitted on completion of post-excavation analysis.[41]

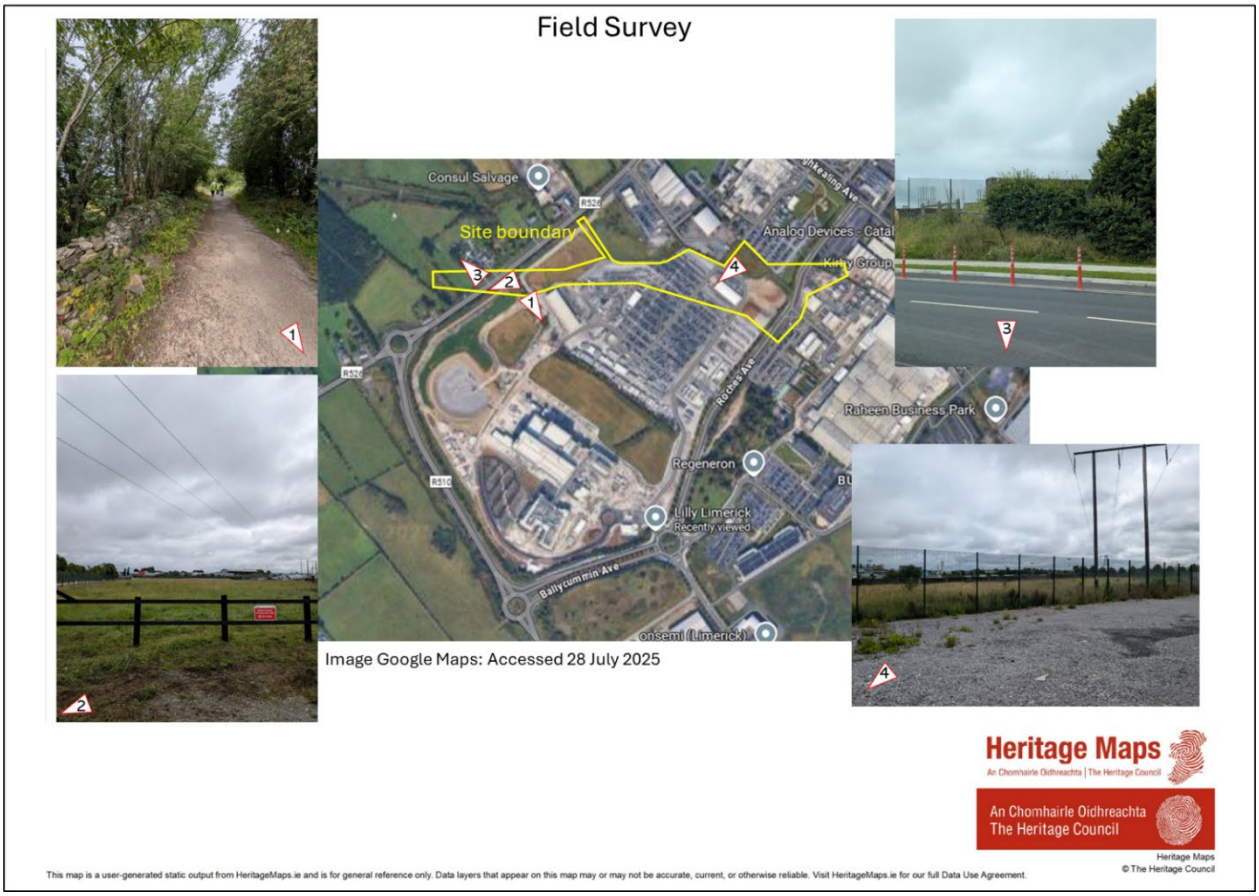
[41] Murphy, pers. comm.

8.2.8 Site walkover survey

A site walkover survey was undertaken on 29 July 2025 in sunny dry weather. As the site is adjacent to an active construction site, the visit was undertaken with a site engineer. The majority of the land has been developed in the recent past in the construction of buildings, access roads and car parking. There are a number of areas of greenfield.

The greenfield areas of the Proposed Development boundary occur in the eastern portion (see Figure 26: Photos 1 and 2 and the northernmost portion (Photo 4)). No features of archaeological interest were noted. A portion of the walled pathway as shown on the first and second edition Ordnance Survey maps survive (Photo 1).

Figure 25 Results of field walking survey



8.3 Potential Impacts of the Proposed Development

8.3.1 Construction Stage

The majority of the Proposed Development is sited on previously developed land. There are two areas of greenfield that have not been subjected to development in the recent past, in the west and north.

The site has been subjected to archaeological investigations, which led to the identification of a number of sites in the vicinity of the Proposed Development, and their subsequent excavation (Excavation Nos. 1999:483-484, 2018:049, 22R0152 and 22E0464). Given the number of archaeological sites found during these investigations, there is the potential for further features to be encountered during ground disturbance of greenfield areas. Should such features occur, they will be negatively impacted on by construction works.

There are no recorded architectural sites within the Proposed Development boundary. A walled laneway depicted on the first and subsequent editions of the Ordnance Survey maps survives in the eastern portion of the Proposed Development boundary but will not be impacted by the Proposed Development works.

Therefore, the potential impact of the Proposed Development on the archaeological, architectural and cultural heritage is deemed to be ***negative***, ***slight*** and ***permanent***.

8.3.2 Operational Stage

No impacts on archaeological, architectural and cultural heritage are expected as a result of the operational phase of the Proposed Development.

8.4 Mitigation and Monitoring Measures

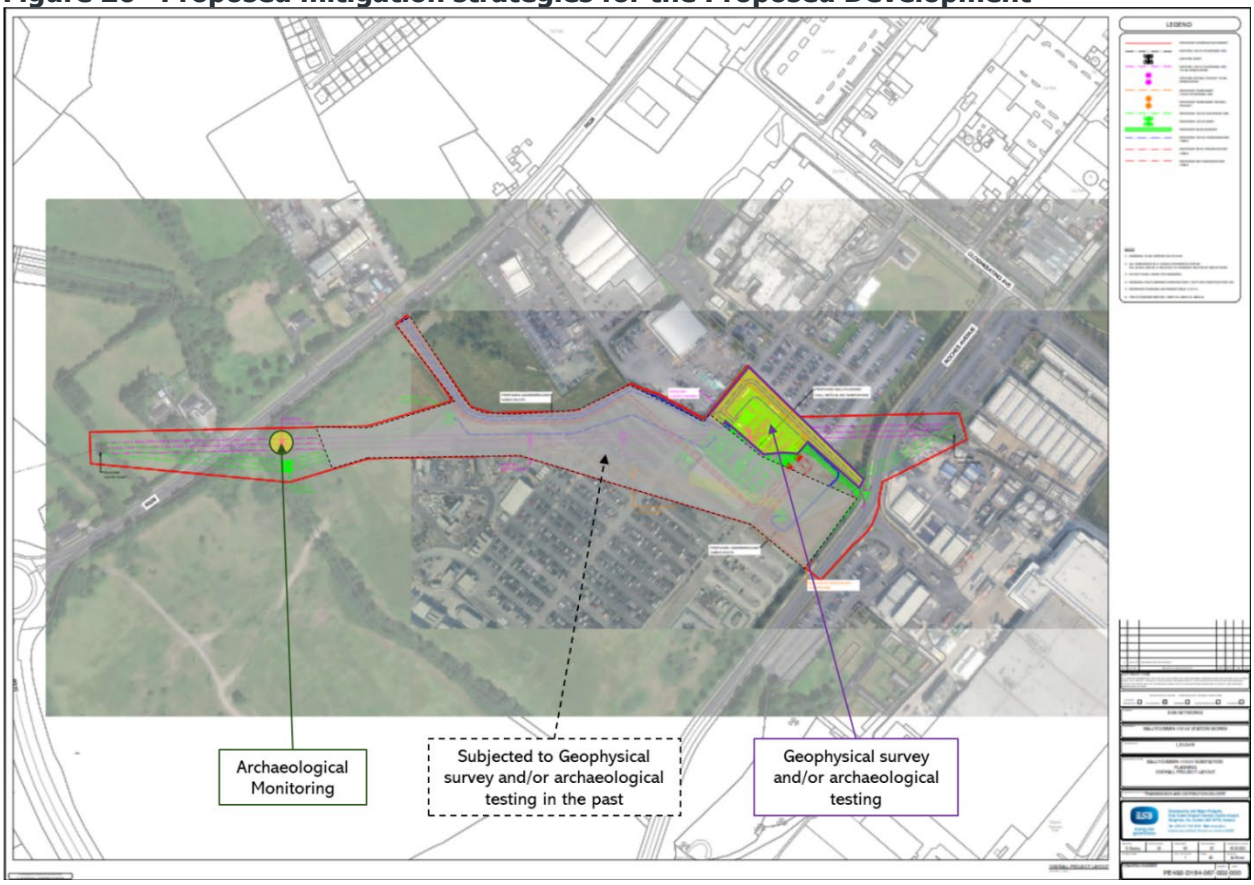
8.4.1 Construction Stage

In order to mitigate against the potential impacts of the Proposed Development on archaeological heritage, the following will be required:

A suitably qualified archaeological consultant should be retained for the construction phase of the project.

Prior to construction works commencing a programme of archaeological investigations, comprising geophysical survey and / or archaeological testing under license to the National Monuments Service, should be undertaken in the greenfield area in the northeast of the Proposed Development boundary, corresponding to the substation compound (see Figure 27).

Figure 26 Proposed mitigation strategies for the Proposed Development



Archaeological monitoring of groundworks associated with the erection of the cable towers in the west of the Proposed Development boundary should also be undertaken under licence to the National Monuments Service.

Should any archaeological features be uncovered during testing or monitoring, and it is not possible to avoid these, then archaeological excavation (preservation by record) should be undertaken, in consultation with and under license to the National Monuments Service.

The walled laneway as shown on the first and subsequent edition of the Ordnance Survey mapping should be suitably protected from impact by construction works including construction traffic.

Should these mitigation measures be implemented, the potential impact of the Proposed Development on the archaeological, architectural and cultural heritage is deemed to be *neutral*, *not significant* and *permanent*.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of Housing, Local Government and Heritage.

8.4.2 Operational Stage

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the Proposed Development.

8.5 Residual Impacts of the Development

8.5.1 Construction Phase

Once proposed mitigation is implemented, the impact will be reduced to *neutral*, *not significant* and *permanent*, with no residual effects during the construction phase relating to archaeological, architectural and cultural heritage

8.5.2 Operational Phase

There are no identified residual effects during the operational phase relating to archaeological, architectural and cultural heritage.

8.6 Cumulative Impacts of the Proposed Development

8.6.1 Construction Phase

During construction there is low potential for cumulative impact as the lands on which the Proposed Development are sited have been extensively and significantly developed in the past. A number of archaeological sites and features were uncovered in the course of advance mitigation measures relating to previous development of the lands, including geophysics and texting. Where construction works were required in the areas of these sites, they were archaeologically excavated (preserved by record) in advance of construction. The excavation of any archaeological features uncovered during archaeological investigations and monitoring of construction works will add knowledge to the academic record.

The academic knowledge gained from the excavation of these features, has resulted in a net cumulative *permanent*, *moderate*, *positive impact*.

8.6.2 Operational Phase

During operation there is no potential for cumulative impact as there will be no disturbance to ground.

9. LANDSCAPE & VISUAL

9.1 Introduction

This section assesses and evaluates the potential impacts of the development on landscape and visual. 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.

9.2 Methodology

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).

This Section has been written based on the methodology as prescribed in the following guidance documents:

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022)
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

Based on initial knowledge of the Proposed Development and surrounding environment, the need for verified photomontages was excluded from the ER scope. The assessment of the potential landscape and visual impacts associated with the Proposed Development here presented are based on a desktop study in consultation with the Limerick County Development Plan 2022-2028.

9.3 Receiving Environment

9.3.1 Limerick County Development Plan 2022-2028

Under the Limerick Development Plan 2022-2028, the site area in its majority is zoned as 'High Tech/Manufacturing Campus' (to provide for office, research and development, high technology, regional distribution/ logistics, manufacturing and processing type employment in a high quality built and landscaped campus style environment) with a small area to its western portion zoned as 'New Residential' (to provide for new residential development in tandem with the provision of social and physical infrastructure).

The proposed substation compound will be fully comprised within the 'High Tech/Manufacturing Campus' zone designation with the objective of:

> *"To provide for office, research and development, high technology, regional distribution/ logistics, manufacturing and processing type employment in a high quality built and landscaped campus style environment."*

In terms of the landscape character of the area, the Limerick Development Plan 2022-2028 includes the Proposed Development lands within the UCA 03 Southern Environs – Dooradoyle/ Raheen/ Mungret Urban Character Area (UCA), described as:

> *"Southern Environs of the city and contains many modern housing developments dating in large part from the 1960s. Major housing initiatives are currently under way in the area. The area also accommodates a range of other uses including the Regional Hospital, Raheen Business Park, the Crescent Shopping Centre, educational institutions and recreational facilities."*

As shown in table 5.1 of Chapter 5 (Environment, Heritage, Landscape and Green Infrastructure) of the Limerick Development Plan 2022-2028, the specific objectives for the UCA 3 Southern Environs are:

- Infill and brown field development patterns to be favoured.
- Special Control Area in Mungret College Area to be retained, together with protected views.
- Mungret masterplan to guide development in this location.
- Existing green spaces to be retained.

Designated scenic views and prospects within County Limerick are outlined in Map 6.2 of the current County Development Plan. The most relevant views in relation to the study area are two located near Mungret Park, situated in the broader north-western section of the site. However, both of these views are oriented northward (facing away from the Proposed Development) and as such, it not considered that they will be impacted by Proposed Development.

9.3.2 Site and Surrounding Environment Baseline

The site is relatively flat with a gentle slope Northwest to Southeast. The level at the centre of the site is approx. 23.80 mAOD. Site levels range from approx. 24.40 mAOD at the Northwestern boundary to 23.30 mAOD at the Southeastern side. A topographic survey is included as Appendix B to the Flood Risk Assessment included with this application (ESB, 2025b).

The only watercourse within the greater area is the Barnakyle River, located approximately 940 m to the south of the development site.

The area surrounding the site features a mix of typical urban and rural land uses. To the east and south, the land falls within Raheen Business Park, which is characterised by large-scale industrial and commercial activity. Notably, major pharmaceutical companies such as Eli Lilly and Regeneron occupy substantial land parcels in this zone. In contrast, the transition to a more rural landscape becomes evident to the south and west, where the environment shifts to pastoral farmland interspersed with networks of mixed hedgerow vegetation.

Currently, the majority of the Proposed Development site is occupied by a large construction area associated with the permitted developments within the Eli Lilly campus. Minor portions of the site also include a remaining green area to the northeast of the Eli illy site, the Regeneron Campus, Roches Avenue, R526 road, a portion of a residential dwelling and an undeveloped plot of land where one of the existing energy masts is located.

The Study Area is characterized by the presence of dense residential zones to the north and northeast including Gouldavoher (c. 500m), Skehacreggaun (c.1.3km), Sluggary (c. 700m) and Dooradoyle (c.1.3km). The remaining residencies within the study area are characterized mostly by sparse residential developments on one-off pattern.

Notable road arteries within the region include the M20 motorway to the east, the N69 national road to the north and the R526 regional road immediately north of the Proposed Development.

The portion of the site designated for the proposed substation is situated directly adjacent to Roches Avenue, making it prominently visible to both pedestrians and road users traveling along this route. Given its proximity to the public road, the substation site occupies a visually exposed location, with minimal screening from surrounding vegetation.

Much of the aspects of amenity within the study area relate to local parks and sports pitches. Mungret Park is one of the more notable public amenities and is situated in the northern extent of the study area, some c. 1km northwest of the site. Mungret Abbey is a medieval friary and National Monument located near Mungret and is some 1.2km northwest of the site. Overall, it is not considered that the study area is highly synonymous with tourism, amenity or heritage.

9.4 Potential Impacts of the Development

9.4.1 Construction Phase

The Proposed Development is situated within the suburban areas of Limerick City, where the landscape is already shaped by a mix of industrial and commercial developments. The construction works proposed within the Proposed Development ~~Eli Lilly~~ site will not alter the existing landscape character, as the area is currently dominated by large-scale construction activity for permitted developments of LCC Planning references 22/190 (as amended) and 24/61160.

However, the remaining green space to the north of the Eli Lilly site, currently undeveloped, will be transformed into a construction compound, resulting in a localised negative impact. Given that the surrounding landscape is already significantly modified, this change will be minor in nature and confined to the immediate area. It is not expected to affect the broader landscape character.

Furthermore, the proposed construction works will have no impact on designated scenic views, recreational amenities, scenic value, or heritage assets.

In terms of construction visibility, the closest sensitive receptors to potential visual impacts are the residential dwellings located along the R526 Road. However, the Proposed Development ~~Eli Lilly~~ site benefits from established boundary treatments along its northwestern boundary, which provide visual screening to proposed works. As the majority of the proposed construction activities will take place internal to the subject site, visual impacts from the R526 Road are expected to be significantly reduced.

To the northeast, the installation of the construction compound and the construction of the proposed substation will introduce a more noticeable visual change, particularly for pedestrians and road users along Roches Avenue. This portion of the site is directly adjacent to the road and lacks substantial screening, making it more visually exposed. Although the surrounding area along Roches Avenue is already heavily modified by existing infrastructure and development, the introduction of construction elements will still result in a negative visual impact during the construction phase.

There will be a loss of relatively small areas of fringing Hedgerow. The sections lost will be 4 to 5m either side of the cable and drainage routes and not significant in terms of the remaining intact sections which are between 45-65m in length. This Hedgerow loss will not particularly increase the visual impact of the site as they are located internally and don't play a significant role in visual screening.

To address this, standard mitigation measures such as temporary hoarding or visual buffers will be required to minimise the extent of visual disruption and preserve the character of the streetscape as much as possible.

Overall, without the implementation of standard mitigation measures, it is anticipated that landscape and visual impacts will be ***negative, slight,*** and ***short-term*** during the construction phase of the Proposed Development.

9.4.2 Operational Phase

Upon completion, the new 110 kV GIS building will stand at approximately 12 metres in height, while the 38/20 kV GIS building will reach 7 metres. The proposed 110 kV double circuit overhead line (OHL) and associated masts will be comparable in height to existing infrastructure in the area.

Once operational, the Proposed Development will integrate into the largely modified industrial setting of the Raheen area and will not appear visually intrusive or out of character. The substation will play a critical role in supporting electrical security and enabling future development within the region. Its function and location are considered aligned with the site's existing land use zoning objectives.

Importantly, the substation will not be visible from the nearest sensitive receptors (residential dwellings) located along the R526 Road. In addition, the implementation of the proposed landscape plan (Macro Works, 2025a), submitted with this application, will introduce boundary planting designed to screen the development from pedestrian and vehicular views along Roches Avenue. Meadow areas featuring native species will also be provided, reducing potential negative landscape impacts from the change of a previous greenfield into an electrical substation.

Overall, it is anticipated that the landscape and visual impacts will be effectively managed through the implementation of the designed landscape measures. Assuming these measures are carried out as planned, the resulting impacts are expected to be limited in scale, localised in nature, and not significant in the context of the surrounding modified landscape. Without the implementation on standard mitigation measures, it is anticipated that landscape and visual impacts will be ***negative, imperceptible,*** and ***long-term*** during the operational phase of the Proposed Development.

9.5 Mitigation and Monitoring Measures

9.5.1 Construction Phase

During the construction phase, the implementation of mitigation measures outlined in the submitted CEMP (2025a) will ensure that potential visual and landscape impacts are effectively managed. These measures will include, but are not limited to, the installation of site hoarding to screen construction activities, maintaining site tidiness as far as practicable, managing the location and height of stockpiles to minimise visual disruption and through the establishment of appropriate set back distances and restriction of access in the areas where hedgerows will be retained.

9.5.2 Operational Phase

It is anticipated that the landscape and visual impacts during operations will be effectively managed through the implementation of the designed landscape measures outlined in the Landscape Plan (Macro Works, 2025a) and the implementation of the Landscape Management and Maintenance Schedule (Macro Works, 2025b), both submitted with this planning application.

To ensure the successful establishment of the landscape proposals, the operational phase must implement monitoring and post-planting care measures in accordance with the Landscape Management and Maintenance Schedule (Macro Works, 2025b) submitted with this application.

9.6 Residual Impact

9.6.1 Construction Phase

The implementation of the mitigation measures recommended in the submitted CEMP (AWN,2025a) and in Appendix B will ensure that the residual impacts on landscape and visual are no greater than ***negative, not significant*** and ***short-term*** during construction.

9.6.2 Operational Phase

There are no identified residual effects during the operational phase relating to landscape and visual.

9.7 Cumulative Impact

9.7.1 Construction Phase

The Proposed Development will incorporate mitigation measures designed to prevent any significant cumulative impacts in conjunction with permitted or committed developments in the area. Furthermore, other developments will be required to implement their own mitigation strategies in accordance with their respective planning conditions. As a result, any potential cumulative impacts are expected to be not significant, short-term in nature and effectively managed through coordinated mitigation efforts.

9.7.2 Operational Phase

Once operational, the proposed substation is expected to have an imperceptible impact on the surrounding area. As such, it is anticipated that no significant cumulative impacts will arise during its operational phase, particularly given the existing industrial context and the nature of surrounding developments.

10. POPULATION AND HUMAN HEALTH

10.1 Introduction

This Section of the ER has been prepared in order to assess the likely significant effects on human health population in respect of the Proposed Development. The likely significant impacts on Human Health and Population in regard to soils, geology and hydrogeology, water, air quality, noise and vibration, landscape and traffic are addressed in detail within the following ER sections:

- Section 5 - LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY
- Section 6 - AIR QUALITY AND CLIMATE
- Section 7 - NOISE AND VIBRATION
- Section 9 - LANDSCAPE & VISUAL
- Section 11 - MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

10.2 Methodology

This Human Health Section examines the health effects relevant to the Proposed Development as they relate to the relevant study area. The description of the 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).

10.2.1 Data Sources of information

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

- Limerick Development Plan 2022-2028
- Geological Survey Ireland Spatial Resources available from https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228
- 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/

10.2.2 Study Area

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, might have a larger area of effect, and these are addressed in further detail in the other sections within this ER.

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).

10.3 Receiving Environment

10.3.1 Location and Character of the Local Environment

Under the Limerick Development Plan 2022-2028, the majority of the site area is zoned as 'High Tech/Manufacturing Campus' (to provide for office, research and development, high technology, regional

distribution/ logistics, manufacturing and processing type employment in a high quality built and landscaped campus style environment) with a small portion to its western portion zoned as 'New Residential' (to provide for new residential development in tandem with the provision of social and physical infrastructure).

The Proposed Development site surroundings are characterized by a mix of industrial use, agricultural lands and residential settlements. A number of industries and other commercial businesses are within close proximity to the Proposed Development.

The Study Area is characterised by the presence of dense residential zones to the north and northeast including Gouldavoher (c. 500m), Skehacreggaun (c.1.3km), Sluggary (c. 700m) and Dooradoyle (c.1.3km). The remaining residencies within the study area are characterized mostly by sparse residential developments on one-off pattern. The nearest sensitive receptors to the Proposed Development are the dwellings located immediately adjacent to, and within the Proposed Development redline by its western portion.

The closest hotel to the Proposed Development is the Great National South Court Hotel located c. 300m northwest. The closest hospital is the Blackrock Health Limerick Clinic c. 450m to the northwest. The closest school is the St. Nessan's National School c. 690m northwest and the closest childcare is Care Bears Day Care Centre c. 650m southeast.

In terms of landscape amenity, most of the development land is currently characterised as an active construction site for permitted developments LCC Planning reference 22/190 (as amended) and 24/61160, with minor portions characterised as an active facility, and some remaining green areas.

The vicinity of the site is similar in character and occupied with large industrial developments. Once operational, the Proposed Development will change the character of the remaining green area located at the footprint of the substation, however, the development will not look out of place when considered in the context of its heavily industrialised surroundings.

10.3.1.1 Risk of Major Accident Hazards or Disasters

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, with a Landslide Susceptibility Classification of Low. 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.

10.3.1.2 Proximity to Seveso Sites

The proposed 110kV electrical substation will be located within the statutory consultation distance of Analog Devices International, a Lower Tier Seveso Establishment. However, it is considered that the substation will be unoccupied with exception for occasional maintenance workers, and the proposed substation will not have any major accident hazards associated with its operations. Therefore, the nature of the Proposed Development is considerable compatible with its location within a COMAH site consultation distance.

COMAH related impacts associated with Analog are expected to be localized to the Analog site, and therefore the Proposed Development is considered appropriate and not likely to be significantly impacted by the Analog COMAH site; and vice versa, nor is the Analog likely to be affected by the Proposed Development itself.

10.3.1.3 Risk of Flooding

According to the Flood Risk Assessment prepared for Proposed Development (ESB, 2025b), the development site is fully located within Flood Zone C and is not at risk of flooding for any of the assessed flood types including fluvial, coastal, pluvial and groundwater.

10.4 Potential Impacts of the Development

10.4.1 Construction Phase

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

- Section 5 - LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY
- Section 6 - AIR QUALITY AND CLIMATE
- Section 7 - NOISE AND VIBRATION
- Section 9 - LANDSCAPE & VISUAL
- Section 11 - MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

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

There will be no impact on the local parks or the larger amenity areas. Foul wastewater discharge from the site will be managed and controlled for the duration of the construction works, therefore will not impact local amenities or the local population.

The construction works will modify the character of the remaining green space within the substation footprint; however, this area is relatively minor and inaccessible to the public, and the development will appear consistent with its surroundings, which are currently part of an active construction site.

During construction of the Proposed Development, there is a risk of accidental pollution incidences from spills and leaks, suspended solids (muddy water with increased turbidity) arising from exposed ground, access roads, dewatering, excavation and ground disturbance, and wastewater arising from accidental discharge from on-site toilets and washrooms.

Due to the lack of direct hydrological connections between the site and surface waterbodies, any potential contamination will be restricted to indirect hydrological connection through the surface water drainage. This is assessed in detail in Section 5 of this ER. In the absence of mitigation, there is potential for ***negative imperceptible*** impacts.

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. 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 dependent dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

In terms of sensitive receptors, the residential dwellings to the west of the site would present the greatest potential for impacts due to its proximity. In the absence of standard mitigation, the potential impact from Air Emissions on Human Health is considered to be ***negative, not significant*** and ***short-term*** during construction.

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 results presented in Section 7 indicate that construction noise levels will be negligible to minor in significance at the closest residential NSLs during the various construction phases of work occurring within the Proposed Development site.

During construction, potential impacts from Traffic and Transportation may include, increased vehicle movements associated with construction staff travelling to / from the site, increased HGV and construction plant movements 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. Without the implementation of mitigation measures the impact from traffic on human health and local population is expected to be ***negative*** and ***not significant.***

There is a negligible risk of external natural disasters, including landslides, seismic activity, volcanic activity and sea level rise. COMAH related impacts associated with Analog are expected to be localized to the Analog site, and therefore the Proposed Development is considered appropriate and not likely to be significantly impacted by the Analog COMAH site. Additionally, the FRA (ESB, 2025b) concluded that the Proposed Development is not at risk any of flooding.

During the construction phase of the Proposed Development, the construction works will adhere to the mitigation measures recommended in the submitted CEMP (AWN 2025a) and in Appendix B to this report which will ensure no significant impacts occur to population and human health. However, it is considered that without the implementation of mitigation measures, the impact on human health and population as result of the Proposed Development will be ***not significant***, ***imperceptible, negative,*** and ***short-term*** during construction phase.

10.4.2 Operational Phase

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

- Section 5 - LAND, SOILS, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY
- Section 6 - AIR QUALITY AND CLIMATE
- Section 7 - NOISE AND VIBRATION
- Section 9 - LANDSCAPE & VISUAL
- Section 11 - MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

Once operational, the Proposed Development will be typically unmanned with a two-person crew visiting site for three days a week. Therefore, it is considered that the development will have no effect on increased employment opportunities in the area.

A reduction in water quality via unmitigated pollutants entering surface water bodies 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 direct hydrological connections between the site and protection areas, and there are no recorded Recreational Waters, Bathing Waterbodies, or Drinking Water Rivers within the study area (Refer to Section 5).

All surface water generated at the site during operations will be catered within the proposed surface water drainage network. Most of the surface water will infiltrate to ground but an outfall pipe will be also provided in case of heavy rainstorm events. Runoff will pass through a catchpit before flowing through the proposed

soakaway system to catch any fines. The system is designed to cater for a range of storm events (including 1 in 5, 1 in 30 and 1 in 100-year storm events) and therefore it is not expected to cause flooding.

Foul water discharges from the development will be minimal and will be directed into the existing municipal foul sewer network. The design ensures there is no risk of contamination that could pose a threat to human health.

As outlined in Section 5.7, the operational phase of the Proposed Development will not involve any main emission sources that could adversely affect air quality. Consequently, the impact on air quality is expected to be ***imperceptible***, with no associated risks to human health.

The Proposed Development operations will include a number of mechanical and electrical equipment to keep the electrical substation running. Section 7 has assessed the potential noise and vibration impacts during operational phase and has concluded that impacts at the closest residential NSLs will be ***neutral***, with no resulting impacts on human health.

In terms of landscape and visual impact, the Proposed Development will represent an intensification of the existing land use in its vicinity and is therefore considered to be a consistent form of development in the context of the overall study area. Additionally, the implementation of the submitted Landscape Plan by Macroworks will enhance the Proposed Development visual screening and visual amenity reducing impacts further.

The Proposed Development will not introduce any main emission point and any additional traffic-related emissions or emissions from the back-up generator will be negligible, resulting in a ***neutral*** impact on human health.

During operations, approximately 6 vehicle movements a week are expected to occur on average. This will result in a negligible change in the traffic environment with no effect on increased queue and delays and a resulting ***neutral*** impact on human health (Refer to Section 11).

There is a negligible risk of external natural disasters, including landslides, seismic activity, volcanic activity and sea level rise. The Proposed Development will not be a COMAH site and COMAH related impacts associated with Analog are expected to be localized to the Analog site. Therefore, the Proposed Development is considered appropriate and not likely to be significantly impacted by the Analog COMAH site. Additionally, the FRA (ESB, 2025b) Report concluded that the Proposed Development is not at risk any of the assessed flood types.

Overall, it is considered that without the implementation of mitigation measures, the impact on human health and population as result of the Proposed Development will be ***imperceptible, neutral,*** and ***long-term*** during operational phase.

10.5 Mitigation and Monitoring Measures

10.5.1 Construction Phase

During construction phase, the Proposed Development will adhere to the CEMP (AWN, 2025a) submitted with this planning application, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

Additionally, further detail on proposed mitigation measures is also available within the corresponding Sections 5.5, 6.5, 7.6, 9.5, 11.5 and Appendix B to this report.

10.5.2 Operational Phase

No mitigation is required for the operational phase of the Proposed Development in terms of impacts to human health and populations.

10.6 Residual Impact

10.6.1 Construction Phase

Following the implementation of the recommended standard mitigation measures outlined in the CEMP and in the above-mentioned Sections, any residual impacts on human health and local populations during the construction phase of the Proposed Development are anticipated to be ***imperceptible, negative,*** and ***short-term.***

10.7 Cumulative Impact

Taking into account the implementation of the outlined mitigation measures, the Proposed Development is expected to have no significant impacts to the assessed environmental factors, with no significant cumulative effects on surrounding developments. Mitigation measures have also been integrated into the design of each permitted development, which will be required to comply with their respective planning conditions and emission limits and therefore no significant cumulative impacts are expected to arise during either the construction or operational phases of the project.

11. MATERIAL ASSETS (ROADS AND TRAFFIC, WASTE MANAGEMENT AND UTILITIES)

11.1 Introduction

This Section of the ER has been prepared in order to assess the likely significant effects on material assets including roads and traffic, waste management and utilities in respect of the Proposed Development.

11.2 Methodology

The assessment of the impacts of the Proposed Development arising from roads and traffic, the use of material assets, and the generation of waste materials, was carried out taking into account the information provided by ESB on the Proposed Development and based on the methodology specified in relevant guidance documents.

Sources of information used include:

- Limerick City and County Council Development Plan 2022 – 2028
- Construction Environmental Management Plan, Ballycummin 110 kV Substation. AWN. 2025a.
- Resource & Waste Management Plan, Ballycummin 110 kV Substation. AWN. 2025b.
- Engineering Services Report. Ballycummin 110 kV Substation. ESB Networks. 2025a.
- Flood Risk Assessment. Ballycummin 110 kV Substation. ESB Networks. 2025b.

11.3 Receiving Environment

11.3.1 Roads and Traffic

In terms of road network, the development site is accessible via Roches Avenue, located within the Raheen Business Park. Notable road arteries within the region include the M20 motorway to the east, the N69 national road to the north and the R526 regional road immediately north of the Proposed Development.

The portion of the site currently located within the Eli Lilly Raheen boundary benefits from existing internal access roads, which are currently utilized by Eli Lilly for the construction of permitted developments. However, the designated area for the construction compound remains undeveloped, with no dedicated access roads currently in place to support construction activities.

The site is situated within a heavily industrialized zone that is undergoing rapid expansion due to ongoing developments across the business park. As a result, the area experiences continuous construction traffic from multiple active projects, in addition to regular operational traffic generated by existing facilities. This combination contributes to a consistently high level of vehicular activity in and around the site.

11.3.2 Waste

In terms of waste management, the receiving environment is largely defined by LCCC 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 National Waste Management Plan for a Circular Economy (NWMPCE) 2024-2030 and the Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland.

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. This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation. It sets out the following strategic targets for waste management in the country that are relevant to the development:

1A. (Residual Municipal Waste) 6% Reduction in rMSW per person by 2030
1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.
2A. (Material Compliance) 90% Material Compliance in the Dry Recycling Bin
2B. (Material Compliance) 10% per annum Increase in Material Compliance in the Residual Bin (90% by end of 2030)
3A. (Reuse) 20kg per person per year.
3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum

The LCCC Development Plan 2022 – 2028 sets out a number of objectives for Limerick City and County. LCCC's waste policies and objectives aim to minimise waste using the Circular Economy concept; mitigate where possible and adapt to the impacts of climate change; protect and improve ground and surface waters; and provide a clean natural environment.

Objectives:

ECON O44: Circular Economy

It is an objective of the Council to support the economic benefits and opportunities that exist in the transition to a more circular economy.

IN O17: Waste Management and the Circular Economy

It is an objective of the Council to:

a) Support innovative, smart solutions and processes, based on the principles of the circular economy to implement the Regional Waste Management Plan for the Southern Region 2015 – 2021 and any subsequent plan, including any targets contained therein.

c) Promote sustainable patterns of consumption and production in the areas of product design, production processes and waste management.

d) Implement the provisions of the Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020 - 2025, DECC, 2020 in the assessment of planning applications.

IN O21: Construction and Demolition

It is an objective of the Council to:

a) Require construction Waste Management Plans to be submitted as part of planning applications, to address waste management on site during construction and mitigation measures to address waste generation, in accordance with the principles of the circular economy and the principles of prevention, renewal and recycle.

In terms of physical waste infrastructure, LCCC no longer operates any municipal waste landfill in the area. There are a number of permitted and licensed waste facilities located in the Southern Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, 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, waste and recovery / reuse facilities would be subject to appropriate selection criteria based on proximity,

competency, capacity, suitability and serviceability in line with the RWMP (AWN 2025b) submitted with this application.

11.3.3 Utilities

The description of existing utilities provided below is based on the Engineering Services Report prepared by ESB (2025a), submitted in support of this application.

Foul Water Drainage

There is currently an existing IDA foul water drainage pipe located within the southern footway of Roche's Avenue. The pipe diameter is 225mm and it falls from west to east. There is no Uisce Éireann foul infrastructure adjacent to the site. A copy of the Uisce Éireann records are included in Appendix B of the Engineering Services Report (ESB, 2025a), along with the GPR survey adjacent to the site.

Surface Water

There is currently two existing IDA owned surface water drainage pipes located within the northern footway of Roche's Avenue as follows:

- A 300mm diameter pipe is flowing west to east and discharges into a drainage ditch on the Eli Lilly site; and
- A 350mm diameter pipe falls from west to east, flowing back into the IDA site.

According to the Engineering Services Report (ESB, 2025a), infiltration testing to BRE 365 was conducted in the adjacent Eli Lilly site in 2022. The infiltration rates varied throughout the site but an infiltration rate of 23.3m/hr was accepted for the infiltration rate within the proposed design.

Water Supply

There is currently an Uisce Éireann 300mm diameter ductile iron watermain and a 300mm diameter uPVC watermain within Roche's Road. A copy of the Uisce Éireann records are included in Appendix B of the Engineering Services Report (ESB, 2025a).

Electrical Infrastructure

The Raheen area is currently served by the Limerick 110/38 kV medium-voltage (MV) network. However, the existing substation is experiencing load capacity and supply constraints due to rapidly increasing energy demand within the Raheen Business Park, driven by ongoing industrial and commercial development.

An existing 110 kV overhead transmission line traverses the Regeneron site, the Eli Lilly site, and adjacent undeveloped lands to the west. The infrastructure includes:

- One transmission mast located within the Regeneron lands
- Four double pole sets situated within the Eli Lilly lands
- One additional mast positioned within the undeveloped lands to the west

11.4 Potential Impacts of the Development

11.4.1 Construction Phase

Roads and Traffic

Section 3.5.6 details expected traffic levels and parking details for the construction phase of the Proposed Development. A maximum daily workforce of approximately 45 people is expected during the peak period

for construction works on site. However, typical daily workforce requirements will be less than this. Car parking for workers and visitors will generally be provided in the contractor's compound. Assuming a vehicle occupancy rate of 1.25, this would result in a maximum requirement of 36 vehicles and 72 movements per day.

It is considered that there will be a maximum of 40 HGV's serving the site during any given daytime. As such, the two-way HGV traffic is unlikely to be higher than 5 vehicles per hour at any point of the day.

It is considered that without adequate traffic management and standard mitigation measures for construction traffic in place, the Proposed Development have potential to negatively impact on traffic congestion, queuing, irregular parking and safety hazards to other road users, pedestrians and cyclists.

It is anticipated that without mitigation in place the Proposed Development will have a potential ***short-term, negative*** and ***not significant*** impact on roads and traffic during construction.

Waste

As outlined in Section 3.5.7 Material Volumes & Construction Waste Management, the Proposed Development will generate a range of non-hazardous and hazardous waste materials during construction. Construction activities will inevitably generate quantities of waste from surplus soils/stones, where materials are oversupplied, incorrect materials delivered, or materials are cut to size on-site. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

It is anticipated that if the waste generated during construction phase is not correctly managed and appropriate mitigation is not implemented, the Proposed Development will have a potential ***short-term, negative*** and ***not significant*** impact.

Utilities

During the construction phase, there is a potential risk of contaminated discharges entering the surface water drainage system. This could occur through accidental spills of fuels, oils, concrete washout, sanitary discharges, or other hazardous materials typically associated with construction activities. If not properly managed, these contaminants could compromise the drainage network and pose environmental risks to downstream ecosystems.

In addition, there is also the possibility of temporary disruption to existing utility services as a result of connection works. These disruptions may affect electricity, water, wastewater, and telecommunications infrastructure, potentially impacting nearby operational facilities and businesses within the Raheen Business Park.

As outlined in Section 3.5.4, any discharges from the welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licensed facility or via temporary connection to the municipal foul sewer upon agreement with Uisce Éireann . In addition, no silty or contaminated construction water will be discharged to any stormwater network.

Storage of fuels and refuelling will be undertaken within a bunded hardstand area. The proposed generator will also be bunded.

Electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. The power and electrical supply

requirements during construction are relatively minor, and electrical disruption during connection works will be kept as minimum as practicable with no significant impact anticipated on existing users.

It is anticipated that without mitigation in place the Proposed Development will have a potential ***short-term, negative*** and ***not significant*** impact on utilities during construction.

11.4.2 Operational Phase

Roads and Traffic

As outlined in Section 3.4.6, during the substation operation the access will be via the proposed new entrance at Roches Avenue. The facility will typically be unmanned and in a worst-case scenario it is anticipated that a two-person crew will be visiting site for three days a week.

During operations, approximately 6 vehicle movements a week are expected to occur on average, representing a minor change from existing traffic baselines. Vehicles accessing the site will be provided with parking facilities within the station compound with no parking allowed on public roads.

Overall, it is anticipated that no mitigation will be required as potential impacts on roads and traffic during the operational phase will be ***neutral, imperceptible, long-term.***

Waste

As outlines in the above section, during operations the proposed substation will typically be unmanned with exception for a few occasional maintenance workers. Consequently, it is expected that waste generation during operations will be minimal and limited to typical office and domestic waste including, sanitary waste, organic waste, food packages, paper, among others.

All waste produced on site will follow standard waste separation protocols and it is not considered that the Proposed Development will have any impact as result of operational waste produced.

Overall, it is anticipated that no mitigation will be required as potential impacts as result of waste will be ***neutral, imperceptible, long-term*** during the operational phase.

Utilities

When operational, foul discharges and water consumption requirements for the Proposed Development will be related to the use of the proposed welfare and eye wash facilities located within the substation compound. Due to the typically unmanned nature of the proposed substation, foul discharges and water consumption levels will be minor and will have no potential to impact the public network.

Surface water during operations will be catered within the proposed surface water network designed for a range of storm events (including 1 in 5, 1 in 30 and 1 in 100-year storm events) and to mimic the natural drainage patterns of the site and replicate greenfield drainage conditions where possible.

Surface water runoff from the proposed substation development will be collected on site by a dedicated drainage network and will discharge to a proposed soakaway and infiltrate to ground. An outfall pipe from the soakaway is also provided to allow water to leave the site during heavy rainfall events, when the rain entering the underground drainage system surpasses the Infiltration rate. A flow control device will limit the flow exiting the site to 2l/s/ha or the greenfield runoff rate and therefore no negative impacts are anticipated as result of surface water during operations.

Once operational, the proposed substation will play a key role in strengthening energy security across the Raheen area. It will also assist in alleviating loading pressures and supply constraints on the Limerick 110/38 kV medium-voltage network, resulting in a positive impact on the region's electrical infrastructure.

Overall, it is anticipated that the Proposed Development will have a ***neutral, imperceptible and long-term*** impact on the surface water infrastructure, foul infrastructure and on water supply and will have a ***positive, moderate and long-term*** impact on the electrical infrastructure.

11.5 Mitigation and Monitoring Measures

11.5.1 Construction Phase

Roads and Traffic

Adherence to the mitigation strategies presented in the CEMP (AWN 2025a) prepared for the Proposed Development will ensure effective traffic management during the construction phase and the minimization, as far as practicable, of potential negative impacts on road users, queuing, traffic congestion and safety hazards.

Mitigation to be implemented include, but is not limited to:

- The proposed construction vehicle routes for the site will require a traffic management plan (TMP). This TMP will be agreed upon with LCCC and TII prior to site workings beginning, if requested by condition;
- Advanced warning signs will be placed at sufficient distances to taper off the entry and exit points;
- Pedestrian marshals will be used as and when required;
- Construction traffic operation would be limited to 0700 to 1900 from Monday to Friday and 0800 to 1400 on Saturday for the off-road construction;
- Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic;
- Deliveries to site will be booked in advance using a delivery schedule, so as to prevent lorry congestion on the road networks surrounding the site;
- Alternative safe routeways will be established for traffic and pedestrians where existing routeways have to be altered, removed or worked on during the project;
- Where possible, deliveries will be scheduled outside of peak traffic times to avoid disturbances to pedestrians and vehicular traffic in the vicinity of the site;
- Approved traffic mitigation measures requested by LCCC can be submitted with an updated CEMP as part of compliance, prior to the commencement of works, if requested; and
- Permits for any oversized loads or road opening licences will be sought from LCCC, where required.

Waste

Adherence to the waste management strategies presented in the CEMP and RWMP (AWN 2025a, 2025b) prepared for the Proposed Development will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the Proposed Development.

Adherence to the RWMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the *Waste Management Act 1996* as amended, and associated Regulations, the *Litter Pollution Act of 1997* as amended and the *National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024)* , and that it will achieve optimum levels of waste reduction, re-use and recycling. The management of all hazardous waste arisings, if they occur, will be coordinated in liaison with Health and Safety Management.
Mitigation to be implemented include, but is not limited to:

- Materials will be ordered on an 'as needed' basis to prevent over supply;
- Materials will be correctly stored and handled to minimise the generation of damaged materials;
- A waste tracking log will be established;
- Sub-contractors will be responsible for similarly managing their wastes;

- All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste;
- All waste receptacles leaving site will be covered or enclosed;
- The site Resource Manager (this may an ESB or Contractor appointed person) will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction;
- Appointed employees will be made responsible for ensuring good site housekeeping;
- A pest control operator will be appointed as required to manage pest onsite during the construction phase of the project;
- Organic and food wastes generated by staff will not be stored in open skips, but in closed waste receptacles;
- Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems;
- The contractor, as part of regular site inspection audits, will determine the effectiveness of the waste management strategy and will assist the project manager in implementing the measures under the RWMP and in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated; and
- If requested by condition, prior to commencement of the excavation, construction activity and removal of any waste off-site, details of the proposed destination of each waste stream will be provided to LCCC, along with waste collection permit numbers.

Utilities

Adherence to the mitigation strategies presented in the CEMP (AWN 2025a) prepared for the Proposed Development, also reflected in Appendix B and previous Section 5.6.1 of this this report, will ensure the minimisation, as far as practicable, of potential negative impacts on the foul and surface water drainage infrastructure, water supply infrastructure and on the electrical infrastructure.

11.5.2 Operational Phase

No mitigation measures are deemed necessary during the operational phase of the Proposed Development in respect of material assets. However, in terms of monitoring, the surface water system must be periodically monitored and inspected in accordance with the manufacturer's recommendations to ensure proper functioning and prevent drainage congestion.

11.6 Residual Impacts

11.6.1 Construction Phase

The implementation of the mitigation measures outlined in the submitted CEMP, RWMP (AWN 2025a, 2025b) and in Appendix B will ensure that the residual impacts on material assets including roads and traffic, waste and utilities are no greater than ***negative, imperceptible*** and ***short-term*** during construction.

11.6.2 Operational Phase

There are no identified residual effects during the operational phase relating to material assets.

11.7 Cumulative Impacts

11.7.1 Construction Phase

Taking into account the implementation of the outlined mitigation measures, the Proposed Development is expected to have imperceptible impacts to the assessed material assets, with no significant cumulative effects on surrounding developments. Mitigation measures have also been integrated into the design of each permitted development, which will be required to comply with their respective planning conditions

and emission limits. Therefore, no significant cumulative impacts are expected to arise during the construction phase of the project.

11.7.1 Operational Phase

Once operational, the Proposed Development will a positive impact on the local electrical infrastructure as it will assist in alleviating loading pressures and supply constraints on the Limerick 110/38 kV medium-voltage network. Therefore, cumulative impacts are expected to have a positive quality and not significant significance.

12. INTERACTIONS

12.1 Introduction

This section of the ER considers the potential interactions and inter-relationships between the environmental factors discussed in Sections 4 to 11 and presents these findings for both the construction and the operational phase of the Proposed Development. The interaction of the impacts, described in Sections 4 to 11 would not give rise to any significant negative impacts on the environment.

12.1.1 Potential Negative Interactions

There is a potential interaction between construction noise and vibration, and negative impacts on human health and biodiversity.

Proposed earthworks during construction phase have the potential to generate dust emissions with a consequent reduction in air quality. As such, the construction phase of the Proposed Development also has the potential to impact on air quality and human health if not adequately mitigated. An adverse impact due to air quality in the construction phase has the potential to cause health and dust nuisance issues. Taking into account the design and mitigation measures set out in this ER, there is no potential for significant interaction between Population and Human Health, and Air Quality during the construction phase.

The potential impacts on human beings are in relation to incorrect management of waste during construction, 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 submitted RWMP (AWN, 2025b), and the mitigation measures in Section 11.5.1, will ensure appropriate management of waste and avoid any negative impacts on the local population.

The construction phase of the Proposed Development has the potential to result in increased sediment runoff which has the potential to interact negatively on surface water quality and on biodiversity. The proposed construction phase mitigation, and the lack of a direct pathway means that the Proposed Development will not result in significant impact on surface water quality in the local area.

The additional traffic expected during the construction phase may have a negative effect on residential amenity and human health. These 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.

Traffic may also have negative interactions with air quality and climate during construction due to the emissions from the burning of fossil fuels associated with vehicles and machinery during the construction. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles (including CO_2 a greenhouse gas) increase. However, the Proposed Development will not result in AADT increases greater than or equal to 1,000 vehicles or 200 heavy duty vehicles and as such is not defined[42] as being affected by air quality.

These potential negative interactions are short-term and associated with the construction phase. This ER has outlined mitigation measures to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice and any

[42] TII Guidance (2022) *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106.*

subsequent planning conditions relevant to the Proposed Development. As such no significant negative interactions are anticipated during construction.

12.1.2 Potential Neutral Interactions

Due to the lack of receptors i.e., no groundwater wells in the vicinity of the site, groundwater source protection areas or direct pathway to surface water, potential accidental pollution to land, soil, geology, hydrogeology and hydrology will not impact on human health during both construction and operational phases of the Proposed Development.

The use of an appropriately designed surface water drainage during operations will mean that the development will result in neutral water impacts in the operational phase with regard to runoff rates and flooding risk.

During operations the changes in operational traffic from the existing baseline will be insignificant. Therefore, traffic-related emissions will have a neutral interaction with air quality and climate. Due to the minor change in operational traffic levels the interactions between traffic and human health will also be neutral.

Considering that for an increase in traffic noise levels by 1 dB, traffic volumes would need to increase by the order of 25% or greater[43], there will be no perceptible increase in noise and vibration levels.

12.1.3 Potential Positive Interactions

During the construction phase, the excavation of any archaeological features uncovered through investigations and monitoring will contribute valuable insights to the academic record, positively impacting the wider population by enriching cultural and historical understanding.

During its operational phase, the Proposed Development will enable a more reliable power supply to the area and local communities, resulting in a positive interaction between material assets and human health and population. The development will also facilitate the access and implementation of decarbonized electricity, resulting in a positive interaction between material assets and air quality and climate.

Furthermore, during the operational phase of the Proposed Development, the ongoing maintenance and maturation of the proposed landscape measures will play a vital role in supporting and enhancing on-site biodiversity, contributing positively to the local ecological network.

[43] DMRB Noise and Vibration (UKHA 2020), Volume 11, Section 3, Part 7. In order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25%

Table 36 Summary of Interactions Between the Environmental Factors

	Population & Human Health		Biodiversity		Land, Soils, Geology, Hydrogeology Hydrology		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.
Population & Human Health			X	X	X	o	–	o	–	o	–	o	+	X	–	+
Biodiversity					X	o	X	–	–	o	–	+	X	X	X	X
Land, Soils, Geology, Hydrogeology, Hydrology							–	X	X	X	X	X	X	X	X	o
Air Quality & Climate									X	X	X	X	X	X	–	+
Noise & Vibration											X	X	X	X	–	o
Landscape & Visual Impact													X	X	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

13. REFERENCES

Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. DEHLG. 2009, Rev 2010.

Consultation Guidelines for Planning Authorities by the DoEHLG, The Planning System and Flood Risk Management. DoEHLG. 2009.

Ireland's Final Greenhouse Gas Emissions 1990 – 2019. Environmental Protection Agency (EPA). 2021a.

GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2020 – 2040. Environmental Protection Agency (EPA). 2021b.

Advice Notes for Preparing Environmental Impacts Statements Draft. Environmental Protection Agency (EPA). 2015.

Advice Notes on Current Practice in the Preparation of Environmental Impact Statements'. Environmental Protection Agency (EPA), Co. Wexford, Ireland. 2003.

Air Quality in Ireland 2022 Report. Environmental Protection Agency (EPA). 2023b.

Guidelines on the information to be contained in Environmental Impact Assessment Reports Draft. Environmental Protection Agency (EPA), Co. Wexford, Ireland. 2017.

Limerick Development Plan 2022-2028.

Ireland's 30-year Climate Averages. Met Éireann. 2023a. Available at: https://www.met.ie/climate/30-year-averages.

One Climate Resource for Ireland. Met Éireann. 2023b. Available at: https://www.met.ie/science/translate.

Guidance on the Assessment of Dust from Demolition and Construction Version 2.2. Institute of Air Quality Management (IAQM). 2024.

TII Guidelines (formerly NRA) for Assessment of Ecological Impacts of National Road Schemes. National Road Authority (NRA). 2009.

Flood Maps. Office of Public Works (OPW). 2025. Available on-line at www.floodmaps.ie.

Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended 2010 (S.I. No. 30 of 2010) and 2015 (S.I. No. 27 and S.I. No. 413 of 2003).

Planning and Development Regulations, 2001 (S.I. No. 600 of 2001).

Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. Transport Infrastructure Ireland (TII). 2011.

Construction Environmental Management Plan, Ballycummin 110 kV Substation. AWN. 2025a.

Resource & Waste Management Plan, Ballycummin 110 kV Substation. AWN. 2025b.

Report for the purposes of Appropriate Assessment Screening, Ballycummin 110kV Substation. Moore Group. 2025.

Landscape Plan. Ballycummin 110 kV Substation. Macro Works. 2025a.

Landscape Management and Maintenance Schedule. Ballycummin 110kV Substation. Macro Works. 2025b.

Engineering Services Report. Ballycummin 110 kV Substation. ESB Networks. 2025a.

Flood Risk Assessment. Ballycummin 110 kV Substation. ESB Networks. 2025b.

Planning Report. Ballycummin 110 kV Substation. ESB Networks. 2025c.

APPENDIX A. RECORDED ARCHAEOLOGICAL EXCAVATIONS

The excavation bulletin website 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[44].

Excavation No.:	**1996:234**
Site name:	BALLYCUMMIN
SMR No.:	N/A
Licence No.:	96E379-AR 14
Author:	Cia McConway, Archaeological Development Services Ltd, Power House, Pigeon House Harbour, Dublin 4
Site type:	Excavation - miscellaneous
Period/Dating:	Undetermined
ITM:	E 554460m, N 652144m
Description:	As part of the Adare-Annacotty Road Improvement Scheme the south-west corner of a field was tested owing to its proximity to a well-preserved rath to its immediate west. A geological survey was carried out in the corner of the field and several anomalies were revealed. Test-trenching concentrated on trying to resolve some of these anomalies. A linear feature, either a stone drain or an old field boundary, running roughly east-west across the field, was picked up during the survey. Trenching showed this to be a fairly shallow stony feature, extending to almost 1.5m in width within a dark crumbly soil. There was no sign of an associated bank although the field has been intensively worked until relatively modern times, which could easily have removed any upstanding features. Closer to the rath another trench was opened, revealing subsoil under a fairly substantial depth of almost sterile ploughsoil. However, in the very south-west corner of this trench a large pit was clipped-roughly in quarter-section. As excavated, it measured almost 1m wide and ran into both the western and southern baulks of the trench. It was cutfrom subsoil level and had a depth of 0.63m. It was almost vertical with a wide, flat base. A thick (0.14m) clay lining along its side consisted of a very plastic, stone-free, yellow-pink clay with occasional charcoal lumps throughout. The base of the pit may also have been clay-lined, but it was not possible to investigate this further in the rather confined space available. The upper fill of the pit consisted of a compact, dry grey/brown soil occasionally flecked with small fragments of cremated bone-though at this time it is not certain that the bone was human. Some small fragments of unburned red clay were also retrieved from the upper fill. The fill changed with depth, becoming more clayey and plastic. Some cremated bone and charcoal flecked this clay. Several pieces of metal slag, one piece showing evidence of having been recut, were found between the pit wall and clay lining in a small hollow towards the base of the pit. While no datable artefacts were found, the nature of the pit and fill strongly indicates that it was associated with cremation activity. A 5m-long trench was opened up, running roughly east-west, close to the rath. This area had been badly trampled by cattle and only a very thin covering of topsoil overlay the natural subsoil. To the very west of the trench, two probable badly truncated postholes were uncovered. Just east of these postholes a substantial ditch, 1.4m wide and 0.7m deep, was excavated. The ditch was V-shaped and filled primarily with a gravelly orange/brown clay. Concentrated within the upper half of the fill were

[44] https://excavations.ie; https://heritagemaps.ie

numerous stones of various sizes. It was not possible to ascertain whether these stones had been deliberately pushed into the ditch, perhaps as the remains of a bank, as the two section faces revealed were fairly different. However, it was noted that the ditch was entirely free of red brick and pottery. Only a few snail shells were recovered.

As excavated, the ditch was running in a north-easterly/south-westerly fashion, though it is not clear whether it is linear or curvilinear in nature. However, its proximity to the rath cannot be dismissed and it is possible that this ditch formed part of the outer earthworks of the rath.

Excavation No.: **1998:382**
Site name: BALLYCUMMIN
SMR No.: N/A
Licence No.: 98E0108
Author: Paul Logue, Archaeological Development Services Ltd, Unit 48, Westlink Enterprise Centre, 30–50 Distillery Street, Belfast BT12 5BJ
Site type: Excavation - miscellaneous
Period/Dating: Bronze Age (2200 BC-801 BC)
ITM: E 554560m, N 652144m
Description: Excavations were undertaken at this site during the periods 2–20 March and 13 May–3 June 1998. The work was carried out in advance of road construction, on behalf of the Road Design Office, Limerick County Council. The site lies in former grounds of Roche Castle, Raheen, Co. Limerick, c. 1km south of the existing N20/21 Limerick-Cork road.

The excavation consisted of two large trenches, Areas 1 and 2, measuring 100m x 10m and 65m x 11m respectively. Area 1 contained twelve features of archaeological significance. The largest of these was a curvilinear gully measuring 6m north-west/south-east x 1.1m with a maximum depth of 0.5m. The other features uncovered in Area 1 had an average diameter of 0.2m and maximum depth of 0.15m. They most likely represent the remains of truncated postholes. No artefacts were recovered during the excavation of this area.

Area 2 contained seventy features of archaeological significance. A line of three subcircular pits and a grouping of larger subrectangular pits seemed to divide the central part of the area, with groupings of smaller pits and postholes to the east and west of them. The three subcircular pits had an average diameter of 0.75m and maximum depth of 0.7m, with the larger pits having average excavated dimensions of 2.5m x 1.5m and depths of 0.5m.

To the east of this division was a grouping of thirteen post-holes, one shallow gully and three stake-holes. The postholes were all subcircular in plan and had an average diameter of 0.3m. The fills of these postholes were similar, mainly being a mottled brown, charcoal-flecked, loam soil. Despite these similarities and an even spacing between the features no definite structural pattern could be defined from the outline of the post-holes.

To the west of the division was a grouping of fifteen postholes and five shallow pits. Within this grouping the partial remains of one likely structure could be discerned. It was formed by an arc of six postholes containing similar fills and possibly associated with a seventh posthole 0.3m outside the arc to the north-east. Adjacent to the eastern edge of the structure an arc of four shallow pits was exposed. The positioning of the pits respected the arc of the structure and as such may relate to it in some way.

A penannular-shaped gully was uncovered in the southern part of Area 2 at a distance of 14m from the partial structure. This had a maximum width of 0.6m and a maximum depth of 0.3m. It partially enclosed an area measuring 3.9m north-south x 3.8m, with the open end to the south. The upper fill of the cut contained the remains of at least two charcoalised timber planks, possibly indicating a structural purpose for the cut.

Two large, paired postholes were uncovered 0.5m to the north of the penannular cut, with a second set of paired postholes 1.1m east of the cut.

The artefacts recovered from Area 2 include one spindle whorl, several saddle quern fragments and many sherds of coarseware pottery. All the finds are likely to be of Bronze Age date.

Excavation No.: **1998:383**
Site name: BALLYCUMMIN
SMR No.: N/A
Licence No.: 98E0504 and ext.
Author: Audrey Gahan, Archaeological Development Services Ltd. Unit 48, Westlink Enterprise Centre, 30–50 Distillery Street, Belfast BT12 5BJ
Site type: Excavation - miscellaneous
Period/Dating: Prehistoric (12700 BC-AD 400)
ITM: E 554560m, N 652145m
Description: The Loughmore Link represents a stretch of c. 750m of the proposed N20/N21 Adare-Annacotty road scheme, within the townland of Ballycummin, Co. Limerick. Removal of topsoil along this part of the road was monitored for archaeological material. Five areas of archaeological significance were identified and excavated. In all cases the features survived only where they cut subsoil, the result of generations of farmland development.

Area 1 consisted of an arc of small pits and postholes filled with charcoal-rich soils. It is possible that the site, which was c. 7m in diameter, represents the heavily truncated remains of a circular hut, of probable prehistoric (Bronze Age?) date.

Area 2 was adjacent to an area previously excavated by Paul Logue (No. 382, Excavations 1998), where substantial evidence of Bronze Age activity was uncovered. Most likely this area was an extension of that activity. The site itself consisted of around 40 post-holes and pits. No discernible structure could be identified, and a saddle quern, within one of the pits, represented the only artefact from the site.

The remaining three areas investigated consisted of random scatters of pits and post-holes. Truncation in the area means that no discernible structures could be identified. No artefacts that could conclusively date the sites were recovered, but, as with the rest of the archaeology within this area, it appears most likely that they date to the prehistoric period.

Excavation No.: **1999:483**
Site name: BALLYCUMMIN
SMR No.: SMR 13:151
Licence No.: 98E0433
Author: Noel Dunne, Newtown, Rathangan, Co. Kildare.
Site type: Fulachta fia and Road - road/trackway
Period/Dating: Multi-period
ITM: E 555013m, N 652370m
Description: Various stages of archaeological investigation were undertaken at Ballycummin between September 1998 and May 1999 in association with the construction of a new computer factory by Dell Products (Europe) B.V. and in compliance with a condition of planning permission issued by Limerick County Council. The investigations also covered the installation of a dual carriageway connecting the factory with the new Loughmore link road and associated storm and foul drains by Shannon Free Airport Development Company Ltd.

Phase 1 involved the pre-development testing of seven potential archaeological sites noted in the environmental impact statement and on aerial photography of the factory site. A single trench was mechanically excavated at each site, six of which were 15m

long, with the remaining trench 10m long. No archaeological evidence was noted during this work.

The factory construction site is on the demesne of Roche Castle—an early 19th-century house. Most of the features encountered in the monitoring of groundworks (Phase 2) relate to farming activity associated with the house. However, to the south-west of the site a fulacht fiadh was uncovered in the digging of a trench for a temporary telecom supply to the contractor's compound. The ploughed-out burnt spread lies immediately under the sod and is 15–19m long and 0.1–0.55m thick. The feature is outside the area of development, and the trench was backfilled following examination and recording.

Phase 3, construction of the dual carriageway to the factory and an ancillary road, necessitated the removal of portions of a trackway, SMR 13:151. A metal-detector survey was undertaken over the stretches of trackway to be removed, which totalled 120m in length. Of 570 readings recorded, 565 were ferrous. Three trenches, each measuring 10m x 1m, were excavated by hand across the feature. These revealed a stone construction, with an elaborate French drain underneath in one of the cuttings. The artefacts recovered include delftware, stoneware sherds, clay pipes, red brick, mortar pieces, glass and iron objects. The trackway is 19th-century in date and may have been used to ferry stone from a nearby quarry to Roche Castle.

Four fulachta fiadh were uncovered during monitoring of the construction of the dual carriageway, ancillary road and associated storm and foul drains (Phase 4). All the sites were subsequently excavated by hand, as two were within the area of road construction while the other two lay close to inserted drains that would affect the hydrology of those sites. All of the fulachta fiadh were evident as ploughed-out spreads and were further interfered with by 19th-century tillage furrows and French drains.

Fulacht fiadh 1 was a rectangular trough measuring 2.6m x 1.65m and 0.35m deep dug into the subsoil. The burnt spread, with an overall diameter of 8.5m, though close by, was completely separate from the trough.

Fulacht fiadh 2 was close to No. 1. The burnt spread measured 9.5m x 7.5m and covered eleven hollows of varying shapes and sizes. Some of these are likely to have been natural depressions; some may have been modified; and others are likely to have been entirely man-made.

Fulacht fiadh 3 consisted of three separate burnt spreads measuring 11m x 4.5m, 10m x 3m and 5.5m x 4m. Two large pits were connected with one of the spreads, one of which is likely to be modern.

Fulacht fiadh 4 was a rectangular trough measuring 2.4m x 1.4m and 0.35-0.4m deep dug into the subsoil. The presence of stake-holes indicated that it was originally timber-lined. The trough was surrounded by a burnt spread measuring 12m x 8.5m.

Excavation No.:	**1999:484**
Site name:	HOWMEDICA LINK ROAD, Ballycummin
SMR No.:	N/A
Licence No.:	99E0376
Author:	Damian Finn, for ADS Ltd., Ballycurreen, Glounthaune, Co. Cork
Site type:	Road - road/trackway
Period/Dating:	Modern (AD 1750-AD 2000)
ITM:	E 555013m, N 652370m
Description:	The Howmedica link road is 500m east of the N20 road and 250m south of the Raheen Industrial Estate. It was constructed as part of the infrastructure for the new Dell Computers European Manufacturing Facility (EMF 3). The road corridor is 30m wide and covers a distance of c. 550m.

The area is one of high archaeological potential. Four fulachta fiadh and a 19th-century trackway have been excavated by Noel Dunne in the surrounding area (see No. 483, Excavations 1999).

The only archaeological feature uncovered in the monitoring of the topsoil clearance was a 48m-long section of the trackway (SMR 13:151).

Excavation No.: 1999:500

Site name: DERRYKNOCKANE
SMR No.: N/A
Licence No.: 99E0093
Author: Ciara MacManus, c/o ADS Ltd. Windsor House, 11 Fairview Strand, Dublin 3
Site type: Fulacht fia
Period/Dating: Prehistoric (12700 BC-AD 400)
ITM: E 555799m, N 650943m
Description: The partial remains of a fulacht fiadh were discovered in the townland of Derryknockane, Co. Limerick, in February 1999, 5km south-west of Limerick City and c. 1.5km south-east of the existing N20 road. The site was uncovered during monitoring of topsoil-stripping for the proposed N20/N21 Limerick Bypass and survived as a spread of charcoal-rich soil and burnt stones.

Excavation of this spread revealed the existence of a large, subrectangular trough pit, 2m long, 1.2m wide and 0.4m deep, with an east-west orientation. A smaller, linear pit (1.6m x 0.65m) lay to the east of the trough, and a large, subcircular pit (1.2m diameter) lay 1.6m to the south-east of the trough.

The trough had been filled by various deposits, which included a sealing layer of redeposited subsoil, over which lay the main fill of charcoal-rich, blackened material containing a large number of burnt stones.

The trough had been positioned upon a small ridge surrounded by marshy land, which sloped off to the west. Much of the dump material from the use of the trough appeared to have accumulated down, and to the base of, this slope, evidenced by a 0.13m-thick spread of mound material in this area.

Only the partial remains of a fulacht fiadh were uncovered during these excavations; the rest of the site was presumably destroyed by agricultural activity in the past. The remains of a linear plough furrow to the east of the trough and those of a large French drain to the west of the trough confirm this destruction.

Excavation No.: 1999:527

Site name: BALLYCUMMIN, Raheen
SMR No.: SMR 15:59 [INCORRECT]
Licence No.: 99E0116
Author: Kenneth Wiggins
Site type: No archaeology found
Period/Dating: N/A
ITM: E 555859m, N 652444m
Description: A test excavation was carried out before a large-scale office development in the Raheen Industrial Estate, adjacent to a large enclosure. An aerial photograph indicated the presence of a potential site to the north of the enclosure, directly below the site of the proposed office block. The test excavation was carried out in March 1999, and each of the cuttings revealed naturally occurring sand and stone directly below the topsoil. No archaeological features or habitation layers were revealed.

Archaeological monitoring of the groundwork associated with the development was conducted in August 1999. Despite the great extent of the area disturbed and its proximity to the enclosure, no archaeological features or deposits were found to exist.

Excavation No.: **2004:0981**
Site name: BAUNACLOKA: Clover Lodge
SMR No.: LI013-009
Licence No.: 04E0196
Author: Tracy Collins, Aegis Archaeology Ltd., 16 Avondale Court, Corbally, Limerick
Site type: No archaeology found
Period/Dating: N/A
ITM: E 554439m, N 653150m
Description: Test-trenching in conjunction with an archaeological assessment was undertaken at Baunacloka, Mungret, in advance of the demolition of a house and the construction of a new house on the same site. The house site is located in the vicinity of the zone of archaeological potential for Mungret Abbey. Two trenches measuring 7.5m and 2.5m in length by 1.5m wide were excavated to the rear of the existing house. Nothing of archaeological significance was identified during the test-trenching.

Excavation No.: **2018:049**
Site name: Site 3, Raheen Business Park
SMR No.: LI013-151
Licence No.: 18E0153
Author: Fintan Walsh, Archaeological Management Solutions Ltd., Unit 1, Hector Street Mills, Kilrush, Co. Clare
Site type: Burnt mounds and post-medieval track
Period/Dating: —
ITM: E 554775m, N 652205m
Description: Testing was undertaken within a 4-ha portion of a proposed development site (Site 3) at Raheen Business Park, Ballycummin, Co. Limerick. The testing was carried out on behalf of Jacobs Ltd and their client, Edwards Life Sciences. A total of 24 test trenches with a total length of 2320 linear metres were excavated across the site. Archaeological remains were revealed in seven test trenches (Trench 8, 12, 13 and 21-24) and designated as three distinct areas of archaeology (Areas 1, 2 and 3).

Area 1 comprises two undated possible pits (C3 and C4). Pit C3 comprises a roughly oval spread of mid brown clay (c.1.4m x 0.9m). Frequent small stones, occasional charcoal flecks and oyster shells were noted. Pit C4 comprises a sub-circular spread of mid brown clay, measuring 0.6m in diameter. It contains some small stones and charcoal flecks. Burnt stones are visible within its matrix.

Area 2 comprises a burnt mound/fulacht fiadh with associated pits/troughs and spreads (C5–C14). Burnt mound deposit C5 consists of charcoal-rich clays and heat-fractured stones. This deposit measures 5m (north-south) by 5m. A feature (C6) 2.5m to the west of this is a possible trough. The trough measures 3m (east-west) by 1.5m. The fill comprises light brown silty clay with charcoal concentrations around the sides. A possible post-hole (C7) is located immediately south-west of C6. Finally, a small spread of charcoal-rich clay (C8) is located 2m north of deposit C5 and is considered to be part of this burnt mound. The second burnt mound deposit (C12) is defined by charcoal-rich clays and heat-fractured stones. This deposit measures 6m (north-south) by 6m. To the south are two pits (C13 and C14). Pit C13 measures 1.4m diameter. The fill is a charcoal-flecked deposit with heat-fractured stone suggesting a cooking pit or 'pot-boiler' feature. Pit C14 measures 1m by 0.5m and has a similar fill to pit C13. Between burnt mound deposits C5 and C12 are two spreads of heat-fractured stones and charcoal-rich clays which extended across the width of the trench (C10: 1.8m [east-west]; C11: 2.2m [east-west]) and a circular pit (C9). Pit C9 (0.6m diameter) has a surface fill of heat-fractured stone and charcoal-rich clay and may also be a 'pot-boiler'.

Area 3 is a recorded 19th-century trackway (LI013-151). The western extent of this was identified in Trench 9 and tentatively identified in Trench 8. The eastern extent

(within the 4 ha portion) is clearly defined as a topographical feature in the landscape. The recorded roadway extent within the development measures c.150m (south-west/north-east). Investigation of the roadway within Trench 21 revealed it to be a raised metalled surface (c.5m wide) composed of tightly-packed rounded pebbles (C15). A fragment of oyster shell and a sherd of post-medieval Blackware pottery were recovered from the surface of the stones.

Excavation No.: **2018:711**
Site name: Raheen Business Park, Raheen
SMR No.: LI013-233
Licence No.: 18E0278
Author: Ian Russell, Unit 21, Boyne Business Park, Greenhills Rd, Drogheda, Co. Louth
Site type: No archaeological significance
Period/Dating: —
ITM: E 555197m, N 652211m
Description: Monitoring of topsoil removal associated with the development of a new car parking facility, and all related groundworks, was carried out at Regeneron, Raheen Business Park, Co. Limerick.

The work was carried out between 4 and 10 July 2018, on behalf of Regeneron Ireland U.C. The work was carried out in compliance with a condition attached to planning reference number 17/1170 of Limerick City & County Council. As part of the archaeological monitoring, two fields were stripped of topsoil under supervision. The south-west field was stripped to natural boulder clay.

The north-east field had been infilled in the past with some 2m of imported material, and hence was not stripped to natural. To the depth excavated, no features or deposits of an archaeological nature were found. It had been considered a possibility that a fulacht fiadh had been buried in this field under the made ground, hence it had been recommended that monitoring be carried out during the groundworks associated with the construction of a permanent car-park. No evidence of any features or deposits of an archaeological nature were identified during monitoring. It is therefore recommended that the proposed development be allowed to proceed without any further archaeological assessment.

Excavation No.: **2019:630**
Site name: Raheen Business Park, Ballycummin, Limerick
SMR No.: LI013-233
Licence No.: 18E0278 ext.
Author: Ed Lyne, Archaeological Consultancy Services Unit, Unit 21, Boyne Business Park, Greenhills, Drogheda, Co Louth.
Site type: Fulacht fiadh and possible well
Period/Dating: —
ITM: E 555171m, N 652169m
Description: A programme of archaeological monitoring and excavation was carried out at Ballycummin, Raheen Business Park, County Limerick. The site contained LI013-233 - Fulacht fiadh, identified under licence 98E0433 by Noel Dunne during a program of archaeological monitoring in 1998-1999.

The excavation took place in May 2019. The site comprised a small fulacht fiadh site in the form of a shallow spread (C3), a possible well (C4) and a shallow pit (C6). These required preservation by record (excavation) as preservation in situ was not feasible.

A number of fulachta fiadh have been excavated in the area around Ballycummin in the past 20 years, mainly as a result of development associated with the Raheen Business Park. Their frequency locally suggests Bronze Age settlement in the area, as well as a plentiful supply of firewood and a water source. The latter in this case may

simply have been as a result of the area being somewhat low lying and perhaps something of a wetland environment during this period.

The primary charcoal fill from the possible well (C4) was sampled and Dr Lorna O'Donnell identified the charcoal as alder. A sample of alder charcoal was chosen for 14C AMS analysis, to obtain a date for the pit/well. The sample analysed returned a date of 3110 ± 30 BP (cal. BC 1440-1280, 2-sigma), placing the site in the Middle Bronze Age, the most typical date range for this site type.

The archaeological features identified during the investigation at the site in Ballycummin have now been fully excavated.

Excavation No.:	**2023:065**
Site name:	Raheen Business Park, Ballycummin
SMR No.:	N/A
Licence No.:	23E0102
Author:	Graeme Laidlow & Seán Shanahan; Shanarc Archaeology Ltd., Unit 39a, Hebron Business Park, Hebron Road, Kilkenny
Site type:	No archaeology found
Period/Dating:	N/A
ITM:	E 554936m, N 651922m
Description:	Archaeological test-excavations were carried out as part of an Archaeological Impact Assessment relating to the proposed construction of a warehouse facility on a c.4.2-hectare greenfield site at Raheen Business Park, Ballycummin, Co. Limerick. A total of five test trenches were machine-excavated at the proposed development site. Trenches 1-4 were laid out in a targeted array across the proposed Phase 1 development area to the north-eastern half of the site. Trench 5 was excavated in the centre of the site, just to the south-west of the proposed Phase 1 development area, within ground forming part of a potential Phase 2 development at the site. Excavated trenches measured 50-120m in length, 1.8m in width and 0.35-1.35m in depth. Topsoil comprised 0.15-0.35m of moderately compact brown clayey-silt with occasional stone; this overly natural subsoil comprising light grey clay with occasional areas of peat. In some areas of the site and noted in Trenches 1 and 5, dumped spoil and modern layers of dumped rubble material overly the topsoil. No archaeological finds, features or deposits were found during testing.

APPENDIX B. SUMMARY OF MITIGATION AND MONITORING MEASURES

Produced By: AWN Consulting Date: Verified by: ESB Networks	Project Name - Ballycummin 110kV Substation
Date: 12/09/2025	ENVIRONMENTAL AND PLANNING CONSIDERATIONS REPORT (EPCR) 2025 - SUMMARY OF MITIGATION AND MONITORING MEASURES

Document	Section	Topic	Sub Topic	Activity	Development Stage
PECR	9.5.1	Excavations	Archaeological Protection	A suitably qualified archaeological consultant should be retained for the construction phase of the project.	Construction
PECR	9.5.1	General Construction Works	Archaeological Protection	The walled laneway as shown on the first and subsequent edition of the Ordnance Survey mapping should be suitably protected from impact by construction works including construction traffic.	Construction
PECR	9.5.1	Excavations	Archaeological Protection	Prior to construction works commencing a programme of archaeological investigations, comprising geophysical survey and / or archaeological testing under license to the National Monuments Service, should be undertaken in the greenfield area in the northeast of the Proposed Development boundary.	Construction
PECR	9.5.1	Excavations	Archaeological Monitoring	Archaeological monitoring of groundworks associated with the erection of the cable towers in the west of the Proposed Development boundary should also be undertaken under licence to the National Monuments Service	Construction
PECR	9.5.1	Excavations	Archaeological Monitoring	Should any archaeological features be uncovered during testing or monitoring, and it is not possible to avoid these, then archaeological excavation (preservation by record) should be undertaken, in consultation with and under license to the National Monuments Service.	Construction
CEMP	4.1	Excavations	Archaeological Protection	Should archaeological features or material be uncovered during archaeological testing or any phase of construction, ground works will cease immediately, and the National Monuments Service of the Department of Housing, Local Government and Heritage will be informed. Time must be allowed for a suitably qualified archaeologist to inspect and assess any material. If it is established that archaeologically significant material is present, the National Monuments Service may require that further archaeological mitigation be undertaken.	Construction
RWMP	4.3.1	Excavations / Waste Management	Contaminated Soil	Site investigations and environmental soil testing will be carried out prior to the removal of excavated material from site.	Construction
CEMP/RWMP	4.2 / 4.3.1	Excavations / Waste Management	Contaminated Material	In the unlikely event that contaminated material is found on site, this material will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' 3 using the HazWasteOnline application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC 4, which establishes the criteria for the acceptance of waste at landfills.	Construction
CEMP/RWMP	4.2 / 4.3.1	Excavations / Waste Management	Asbestos	There is no demolition of structures associated with the development so there will be no need to undertake a demolition asbestos survey for the development. In the event that Asbestos Containing Materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.	Construction

Document	Section	Topic	Sub Topic	Activity	Development Stage
CEMP/RWMP	4.2 / 4.3.1	Excavations / Waste Management	Hazardous Soil and Historically Deposited Waste	In the unlikely event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify Limerick City and County Council (LCCC) and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s).	Construction
RWMP	6.5	Excavations / Waste Management	Bedrock	While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is unlikely that it will be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from LCCC.	Construction
CEMP	4.2	Excavations	Hazardous/Contaminated Soil Management Plan	In the event that any additional engineering measures need to be designed for contamination hotspots, or areas where hazardous soil is encountered, the Contractor will include detail of these measures in any such Hazardous/Contaminated Soil Management Plan to be submitted to LCCC.	Construction
CEMP	5.3	Construction Compound	Welfare Facilities	Any discharges from the welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licensed facility. Foul waste will be disposed off-site using appropriate facilities.	Construction
CEMP / RWMP	5.3 / 4.3.2	Construction Compound	Fuels	Fuels and oils are classed as hazardous materials. Any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site	Construction
CEMP	5.3	Construction Compound	Energy generators	Generators during construction phase shall also be bunded to avoid spills and leaks.	Construction
CEMP	5.6	Construction Compound	Material Handling and Storage	Key materials will be ordered by specific order for the project, a 'Just in Time' delivery system will operate to minimise storage of materials. Where possible it is proposed to source general construction materials from the Limerick City and County area to minimise transportation distances.	Construction
CEMP	5.6	Construction Compound	Material Handling and Storage	Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in the compound area within the site.	Construction
CEMP	5.6	Construction Compound	Material Handling and Storage	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 5) to prevent spillage.	Construction
CEMP	5.6	Deliveries	Material Transportation	Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape of material along the public roadway.	Construction
CEMP	5.7	Site Visitors	Visitors Induction	Visitors will only be allowed to enter the main site compound via the designated pedestrian access gate. A dedicated, secured footpath to the site office is established at the gate for registration and obtaining PPE prior to entering the site. A log will be maintained by security to control access to the site. Visitors will be required to attend a site-specific induction to allow access to the compound and/or construction site unless being accompanied by an inducted member of the site team.	Construction

Document	Section	Topic	Sub Topic	Activity	Development Stage
CEMP	5.8	Construction Hours	Binding Hours	Site development and building works will only be carried out between the hours of 0700 to 1900 Mondays to Fridays inclusive and between 0800 and 1400 hours on Saturdays. Unanticipated issuedsissues amymay arise which require occasional working outside these periods including concrete pours, inspections etc. Construction and Dismantling works outside the above mentioned construction hours will only be undertaken with prior written approval of the local authority. There will be no construction works carried out on Sundays or public holidays. Deviation from these times will only take place when written approval is granted by LCCC in exceptional circumstances.	Construction
CEMP	6	Construction Hours	Construction Traffic Binding Hours	Construction traffic operation would be limited to 0700 to 1900 from Monday to Friday and 0800 to 1400 on Saturday for the off-road construction. These times may vary to facilitate specific site requirements and/or construction activities associated with the site. Any variation will be discussed and agreed in advance with LCCC.	Construction
CEMP	6	Traffic Management	Traffic Management Plan	If required by condition, a Traffic Management Plan (TMP) have to be agreed upon with LCCC and TII prior to site workings beginning. The agreed Plan shall be implemented during the entire duration of the construction works.	Construction
CEMP	6	Traffic Management	Traffic Management Plan	Permits for any oversized loads or road opening licences will be sought from LCCC, where required.	Construction
CEMP	6	Traffic Management	Pedestrian and Road safety	Advanced warning signs will be placed at sufficient distances to taper off the entry and exit points. Pedestrian marshals will be used as and when required. Mitigations that minimise the interaction between the construction site and the local residential areas shall be implemented.	Construction
CEMP	6	Traffic Management	Traffic Management Plan	Approved traffic mitigation measures as requested by LCCC can be submitted with an updated CEMP as part of compliance, prior to the commencement of works, if requested.	Construction
CEMP	6.1	Traffic Management	Deliveries	Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic. Deliveries to site will be booked in advance using a delivery schedule, so as to prevent lorry congestion on the road networks surrounding the site. Alternative safe routeways will be established for traffic and pedestrians where existing routeways have to be altered, removed or worked on during the project. Where possible, deliveries will be scheduled outside of peak traffic times to avoid disturbances to pedestrians and vehicular traffic in the vicinity of the site.	Construction
CEMP	6.2	Acess and Visibility	Site Hoarding and Security Fencing	All areas of construction will be fenced / hoarded off to prevent unauthorized access. This fencing will remain closed at all times during construction works and closed and locked after construction work hours / break times. This fencing will be erected in accordance with good practice and the Construction Regulations 2013. Fencing arrangements will be reviewed as the life of the project progresses.	Construction
CEMP	7.1	Construction Lighting	Lighting Spill	All construction lighting, whether fixed or portable, must be directed downward at a 45-degree angle and positioned to avoid shining toward sensitive receptors. Where feasible, lighting within the site compound should also follow the same strategy to minimize potential disturbance.	Construction
CEMP	7.2.1	Air Quality	Complaint Registers	A complaint registers will be kept detailing all complaints received in connection with construction activities, together with details of any remedial actions carried out.	Construction
CEMP	7.2.1	Air Quality	Fossil Fuel Emissions	Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive. Also, pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional.	Construction

Document	Section	Topic	Sub Topic	Activity	Development Stage
CEMP	7.2.1	Air Quality	Dust Monitoring	If requested by the planning authority, dust deposition levels will be monitored in order to assess the impact that site activities may have on the local ambient air quality. The following procedure will be implemented: - The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring will be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities. - The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures - After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m2/day in accordance with the relevant standards. - Technical monitoring reports detailing all measurement results, methodologies and assessment of results will be subsequently prepared and maintained by the Site Manager. A limit value of 350 mg/m2/day will be used in comparison with recorded values	Construction
CEMP	7.2.2	Air Quality	Dust Management	A speed restriction of 16 km/hr on unsealed roads and 32km/hr on sealed roads will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site.	Construction
CEMP	7.2.2	Air Quality	Dust Management	Bowsers will be available during periods of dry weather throughout the construction period. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use.	Construction
CEMP	7.2.2	Air Quality	Dust Management	Any hard surface roads will be swept to remove mud and aggregate materials from their surface, as required. Any unsurfaced areas will be restricted to essential site traffic only.	Construction
CEMP	7.2.2	Air Quality	Dust Management	During dry and windy periods, and when there is a likelihood of dust nuisance, watering will be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust.	Construction
CEMP	7.2.2	Air Quality	Dust Management	During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided.	Construction
CEMP	7.2.2	Air Quality	Dust Management	The movement of trucks containing materials with a potential for dust generation to an off-site location will be enclosed or covered.	Construction
CEMP	7.2.2	Air Quality	Dust Management	Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.	Construction
CEMP	7.2.2	Air Quality	Dust Management	Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust.	Construction
CEMP	7.2.2	Air Quality	Stockpiling/ Dust Management	Where it is expected that overburden / topsoil will need to be stockpiled for some time, these should be seeded to prevent wind whipping. In such cases, the stockpile(s) may need to be watered periodically during dry weather until seed is established.	Construction
CEMP	7.3	Biodiversity	Site Clearance	All site clearance works will comply with current legislative requirements and best practice.	Construction

Document	Section	Topic	Sub Topic	Activity	Development Stage
CEMP	7.3	Biodiversity	Site Clearance	Key ecological receptors, such as the hedgerows onsite will be cordoned off with appropriate set back distances, as advised by the environmental/ ecological clerk of works.	Construction
CEMP	7.3	Biodiversity	Site Clearance	Potential impacts on habitats will be offset by additional Landscape management and suitable planting of habitats with native species for the promotion of Biodiversity.	Construction
CEMP	7.3	Biodiversity	Site Clearance	Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March 1 to August 31, where possible. Pre-construction nest checks shall be undertaken by an experienced ecologist prior to works commencing where works during the breeding season are unavoidable	
CEMP	7.3	Biodiversity	Site Clearance	Any trees with potential roosting features for bats will be checked for bats in advance of any felling/ trimming works by an experienced ecologist.	Construction
CEMP	7.3	Biodiversity	Site Boundary	Taking measures to limit the working area during the construction phase will reduce the impacts of the development on adjacent areas. The construction area will be clearly delimited by the site boundary and machinery will operate only within this allocated site area.	Construction
CEMP	7.3	Biodiversity	Fuels	All re-fuelling of plant, equipment and vehicles will be carried out at in designated areas of the site, away from surface water drains. Refuelling will be undertaken off site where possible.	Construction
CEMP	7.3	Biodiversity	Fuels	All fuels, chemicals, liquid and solid waste will be stored in areas bunded in accordance with established best practice guidelines at the construction compound also.	Construction
CEMP	7.3	Biodiversity	Fuels	The construction contractor must ensure the provision of Spill Kits to be used in the case of any accidental spills/discharges.	Construction
CEMP	7.3	Biodiversity	Run-off	A water and sediment management plan will have to be provided ensuring that surface water run-off is controlled such that no silt or other pollutants enter local water courses or drains.	Construction
RWMP	4.3.3	Biodiversity / Waste Management	Invasive Species	If any third schedule invasive species detected during the construction phase of the development, then an invasive species management plan will be produced and submitted to LCCC.	Construction
CEMP / ER	7.3 / 4.5.1.4	Biodiversity	Bat Sensitive Lighting	'Bat-sensitive lighting' for this development would have the following design principles: If lighting is required near site boundaries, the lighting poles will be installed on the boundary and will face inwards (i.e. towards the centre of the site). This will ensure that lighting is not directed outside the site boundaries; All lights around the site boundary will be fitted with directional hoods and/or luminaires to direct the light downwards onto targeted areas and to prevent unnecessary light-spill; The intensity of lighting will be kept to the minimum level required for safety and securit; Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used. These measures will apply both to temporary lighting during the construction of the proposed development, and to permanent lighting during the operation of the development.	Construction and **Operation**
ER	4.6	Biodiversity / Landscape	Monitoring / Landscape Management	A Landscape Plan has been prepared to increase Biodiversity where possible. This involves, maintaining the laneway hedgerows areas for encouraging biodiversity and planting native and managing wildflower areas where feasible. Management will include appropriate seasonal vegetation cutting, replanting saplings to replace hedges, rough and grassy verges allowing unmanaged verges to develop natural wildflower components.	**Operation**

Document	Section	Topic	Sub Topic	Activity	Development Stage
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	In the first growing year it is important to control the development of competing vegetation and weeds along the base of the hedgerow. This will help the overall establishment of the lower branches of the plants, giving a more favourable dense basal layer to the hedgerow. Manual weeding is preferable as chemical herbicides can damage young hedgerow plants. Mulching immediately after planting will also help to suppress any weeds. Noxious weeds (Dock, Thistle, Ragwort) shall not be allowed to flower and all such weeds shall be killed or removed at each maintenance visit.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	Within the first summer season any dead or dying stock is to be counted, tagged and replaced during the following planting season. Occasional plant failure is not of particular concern as this can lead to more 'natural' looking hedgerows.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	Hawthorn can be trimmed back to encourage new growth at its base. This will ensure and dense, bushy plant habit in the long term.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	Once established new sections of hedgerow should be trimmed on a 2-3 year rotation to encourage flowering pollinators and fruiting for birds. This will encourage faster hedgerow growth, which will ensure a natural, bushy form. When trimming hedgerows it is important to use reciprocating bar cutters that slice through branches leaving a neater cut. This gives the plants a better chance of healing without infection. Hedgerow trimming and maintenance should only take place between the 1st of September and the last day of February to avoid harming nesting birds.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	Existing sections of hedgerow should also be trimmed on a 2-3 year rotation to encourage gradual consolidation to a minimum height of 4m and to promote dense and bushy habit. Trees and hedgerows are not to be cut during nesting and breeding season between the 1st March and the 31st August, in order to protect nesting birds.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	If gaps become apparent in the hedgerows over time, long-term management solutions (20-30 year intervals) such as laying or coppicing may be needed and will help to retain the hedgerows biodiversity, density and structure.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Hedgerow aftercare	Once weed growth is not highly prevalent within the wild grass seeding area, they will only need to be trimmed back on an annual basis, usually in late August. Noxious weeds to be manually removed from grassed areas.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Field Margins / Grass Seeding	It will be important to flail this margin every year (Sept. 15th to Feb.28th) to cut back the vegetation and prevent the hedgerow from encroaching onto the field margin. Cutting the ground vegetation will allow light down to ground level and thus encourage wild flowers to germinate the following year.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	General Planting Aftercare	Planting shall be tended for 36 months from the date of completion of all Works.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	General Planting Aftercare - Weeding	Throughout the aftercare period keep all shrub planting areas weed free. For tree planting keep an area of 1 m. in diameter around each planting station in a weed free condition. This may be achieved by the use of an approved herbicide or by regular cultivation. A minimum of 3 visits for weed control will be required during the growing season. All injurious weeds, will be removed from the remainder of each transplant tree or shrub plot. The growth of herbaceous material between the weed free planting stations should be controlled by strimming twice per year.	**Operation**

Document	Section	Topic	Sub Topic	Activity	Development Stage
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	General Planting Aftercare - Stakes, Trees, Shrubs and Ties	All stakes, trees and shrubs shall be maintained in firm positions within the ground and with all ties securely fixed and adjusted to allow for the increase in stem girth.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	General Planting Aftercare - Replacements	Plants that fail to thrive, are removed, uprooted or destroyed or die during the aftercare period will be replaced with equivalent plants as soon as possible during the following planting season. Replacements shall be of the same size and species as that originally specified unless otherwise agreed with the Planning Authority. Defects shall be made good by the end of the planting season of the year in which the defect is identified. - Shrub areas – all dead stock shall be replaced at the end of each growing season to obtain 100% stocking - Cell grown/root trainers and transplant planting – throughout the aftercare period, all dead stock shall be replaced at the end of each growing season to obtain 90% stock providing that failures are evenly distributed throughout both planting areas and species - Standard trees – throughout the aftercare period all dead and diseased stock shall be replaced at the end of each growing season.	**Operation**
Landscape Management and Mantainance Schedule	1.5	Biodiversity / Landscape	Monitoring	An experienced Landscape Contractor or qualified Landscape Architect should monitor the site on an annual basis for the duration of the 3 yr Maintenance and Management Schedule and make adjustments to the Management and Maintenance Strategy where required.	**Operation**
CEMP	7.4	Noise and Vibration	Liaison with the Public	The designated complaints contact will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the complaints contact will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. Any noise complaints related to activities at the site will be logged and investigated and, where required, measures taken to ameliorate the source of the noise complaint.	Construction
CEMP	7.4.3	Noise and Vibration	Noise Monitoring	During the construction phase, spot check noise monitoring may be required where the construction noise thresholds have the potential to be exceeded at noise sensitive locations. If required, the monitoring will be carried out by the contractor and used to inform the requirement for any control measures on site to reduce construction noise levels. Noise monitoring will be conducted in accordance with the International Standard ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017)18.	Construction
CEMP	7.4.3	Noise and Vibration	Noise Monitoring	Where required, or requested by the local authority, unattended external noise monitoring will be undertaken at locations on the site boundary closest to sensitive locations. It is considered that it will be appropriate to amend the monitoring program and location as the works progress. Accordingly, monitors may be added, removed or relocated as necessary.	Construction

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CEMP	7.4.3	Noise and Vibration	Vibration Monitoring	Where required (i.e. where there is potential for exceedance of the vibration thresholds for buildings in Table 7.2 of the CEMP), or requested by the local authority, vibration monitoring will be installed at the site boundary to monitor Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions, in accordance with BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures. The mounting of the transducer to the vibrating structure will need to comply with BS EN ISO 5348: 1998: Mechanical vibration and shock – Mechanical mounting of accelerometers.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	All works on site will comply with BS 5228 2009+ A1 2014 (Parts 1 & 2) which gives detailed guidance on the control of noise and vibration from construction activities.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	The selection of quiet plant equipment must be prioritazed when posible and noise must be controlled at the source including the use of screening if required.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	Site compounds shall be located away from noise sensitive boundaries within the site constraints	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant will be switched off when not in use and not left idling.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system and avoid idling of engines when not in use.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	For percussive tools, noise mitigation can be achieved by fitting a muffler or sound reducing equipment to the breaker ‘tool’ and ensuring any leaks in the air lines are sealed. Erection of localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries is also an option.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	The use of a high quality construction site hoarding will be included around all noise sensitive boundaries.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.	Construction
CEMP	7.4.3	Noise and Vibration	General Mitigation	All site staff will be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.	Construction
CEMP	7.5.1	Waste Management	Waste Minimisation	Materials will be ordered on an ‘as needed’ basis to prevent over supply.	Construction
CEMP / RWMP	7.5.1 / 3.2	Waste Management	Waste Minimisation	Materials will be correctly stored and handled to minimise the generation of damaged materials.	Construction
CEMP / RWMP	7.5.1 / 9	Waste Management	Waste Minimisation	Sub-contractors will be responsible for similarly managing their wastes.	Construction
CEMP	7.5.1	Waste Management	Waste Minimisation	All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste.	Construction

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CEMP	7.5.2	Waste Management	Waste Storage	The main waste storage area will be located in the site compound. A dedicated and secure area containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the development.	Construction
CEMP / RWMP	7.5.2 / 6.5	Waste Management	Waste Storage	All waste receptacles leaving site will be covered or enclosed.	Construction
RWMP	4.3.5	Waste Management	Waste Storage Hazardous	Any generated WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.	Construction
RWMP	4.3.5	Waste Management	Waste Storage Hazardous	Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.	Construction
RWMP	6.5	Waste Management	Waste Storage Hazardous	On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.	Construction
CEMP / RWMP	7.5.2 / 6.5	Waste Management	Waste Segragation	Waste materials generated will be segregated at the site compound, where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source.	Construction