

**Environmental Report – Volume 1**  
**Proposed 2No. 110 kV Substations**  
**and Grid Connection**

**On behalf of**  
**Hazelboro Limited.**

**Toomes and Monvallet Co. Louth**





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## EXECUTIVE SUMMARY

Malone O'Regan Environmental (MOR) were commissioned by Hazelboro Limited ('the Applicant') to prepare an Environmental Report (ER) in respect of both the construction and operation of the proposed 2No. 110kV substations development, underground grid connections and associated works (henceforth referred to as the 'Proposed Development'). The Proposed Development will be located on a site that is ca. 1.75 hectares (ha) in size and located in the townlands of Toomes, and Monvallet Co. Louth (OSI Grid Reference ITM 693889, 802864) and is shown in Figure 1-1 ('the Site').

On the 6<sup>th</sup> of March 2023, the Board confirmed the lodgement by the applicant of a request to enter into pre-application consultations under section 182E of the Planning and Development Act, 2000, as amended in respect to the Proposed Development.

The Applicant entered into pre-application consultation with the Board, as provided for in Section 182E of the Act in March 2023. ABP formally confirmed on the 6<sup>th</sup> of June 2023 that the Proposed Development was strategic infrastructure in accordance with Section 182A of the Planning and Development Act, 2000, as amended (see Appendix B).

An Environmental Impact Assessment (EIA) Screening was undertaken which concluded that the Proposed Development does not warrant an EIAR. Regardless, robust environmental assessments have been undertaken in support of this SID application, the findings of which are presented in this ER. For the purposes of this report, the 2No. 110kV substations, underground grid connection and permitted Solar PV, the battery storage units and all associated infrastructure works, will be evaluated to assess the cumulative impacts of the overall development.

The key conclusions of the ER are that the Proposed Development will not result in any likely or significant environmental impacts based on the following:

- The proposed design has taken full cognisance of all requirements of the Louth County Development Plan 2021-2027.
- The Permitted Developments will not be able to function as standalone developments as these will be reliant on connections to the Proposed Development in order to connect to the grid.
- The Ecological Assessment concluded that the lands within the Site are currently of low ecological value, and that the Proposed Development will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 sites or on any notable / protected flora and fauna.
- The Proposed Development will not require any alterations to the existing drainage network and no specific drainage infrastructure will be required.
- The landscaping proposed as part of the Permitted Developments will ensure that the Proposed Development will not result in any significant residual impacts on receptors in regard to direct visual impacts.
- Sufficient setbacks will be implemented from all sensitive receptors - adjacent dwellings, transport route receptors (road) and onsite tree / hedge lines and therefore no adverse effects either during the construction or the operational phase will occur.
- Detailed noise modelling concluded that there will be no cumulative noise impacts arising from the Permitted Development and the Proposed Developments at any nearby receptors either during day or night-time periods.
- No protected archaeological monuments are located within the Site. There will be no impact on archaeological receptors as a result of the Proposed Development.

- The Proposed Development will be accessed via the Phase 1 permitted development (PR 21/631) access off the L5141. Safe sightlines have been achieved.
- A Preliminary Construction Environmental Management Plan (pCEMP) has been submitted in support of the planning application. This pCEMP is a 'living document' and will be used by the appointed contractor to prepare an updated and comprehensive pCEMP prior to the commencement of any onsite works. It is proposed that this plan will be agreed with the Council in advance and will be fully implemented during the construction of the Proposed Development.
- The Proposed Development will have a design life of approximately 35 years at which time it will be fully decommissioned, and lands reinstated.

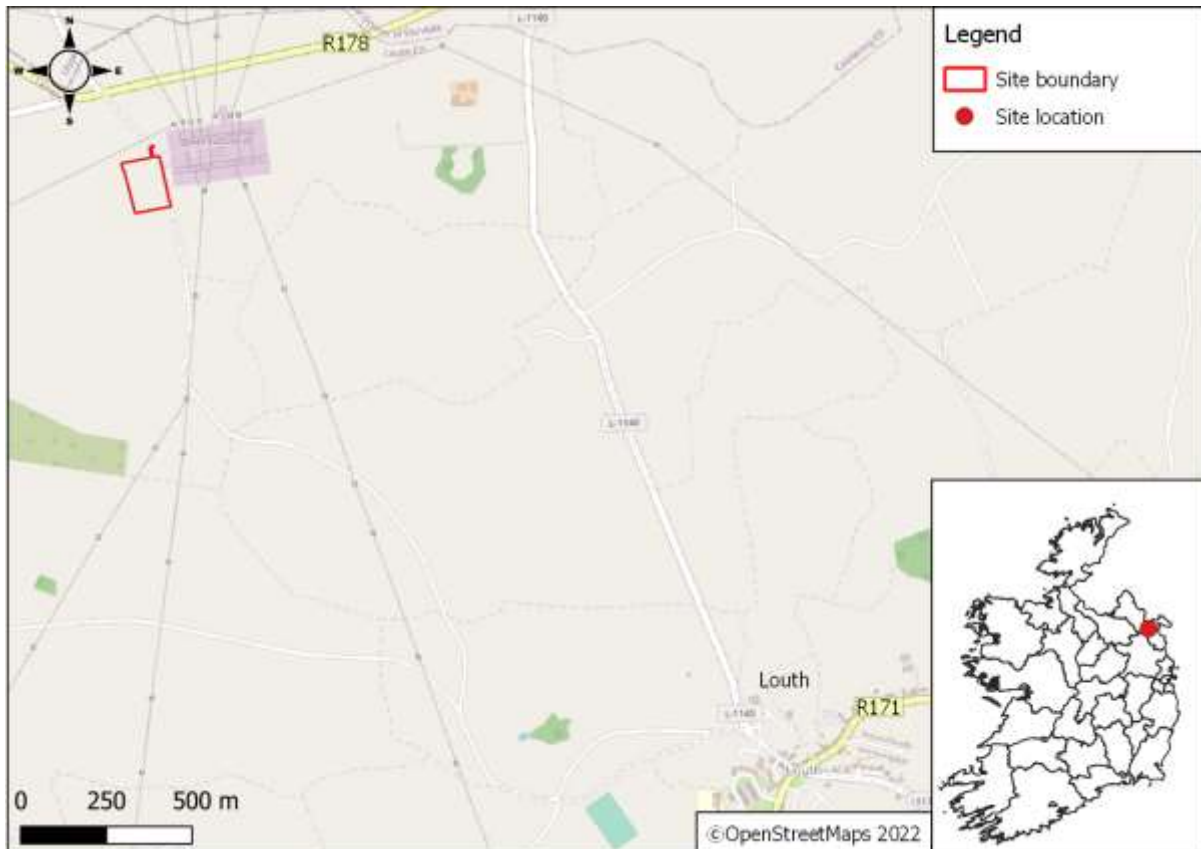
# 1 INTRODUCTION

Malone O'Regan Environmental (MOR) were commissioned by Hazelboro Limited. ('the Applicant') to prepare an Environmental Report (ER) in respect of both the construction and operation of a proposed 2No. 110kV substation's, grid connections and associated works (henceforth referred to as the 'Proposed Development').

The Proposed Development will be located on a site that is ca. 1.75 hectares (ha) in size and located in the townlands of Toomes, and Monvallet Co. Louth (OSI Grid Reference ITM 693889, 802864) and is shown in Figure 1-1 ('the Site').

This report comprises of two volumes with the main report presented in Volume 1, with the supporting appendices presented in Volume 2. This report should be read in conjunction with the following other reports that have also been submitted in support of this Strategic Infrastructure Development (SID) application: Natura Impact Statement (NIS), Preliminary Construction Environmental Management Plan (pCEMP), Decommissioning Plan and Engineering report. All Site layout drawings are presented in Appendix A.

**Figure 1-1: Site Location**



## 1.1 Background

The Proposed Development will be critical infrastructure that will be intrinsically linked to the permitted renewable energy projects, comprising of both solar and battery storage developments. Details of these projects are described below. These renewable energy projects will not be able to function as standalone developments as they will be reliant on connections to the Proposed Development in order to connect to the national grid.

For the purpose of this report 'Permitted Developments' will refer to Phase 1 PR 21/631, its subsequent extension Phase 2 PR 21/1478 and its approved solar PV development extension Phase 3 PR 22/534. A current SID with ABP will also be outlined with respects to a singular 220kV substation. The phased developments are outlined in Figure 1-2 below.

### **Louth County Council Ref. No: 21/631 (Phase 1 - Granted)**

This permitted development is for the construction of a solar PV and battery energy storage system development with associated substations and grid connections on a ca.42.23ha site.

The Proposed Development will be superseding the following elements of PR: 21/631 only:

- 2No. 37kV sub-stations, one serving the solar PV development, the other serving the battery energy storage system development;
- 1No. 110kV sub-station and associated grid to be connected to Phase 1 as soon as possible.

### **Louth County Council Ref. No: PA 21/1478 (Phase 2 - Granted)**

PR 21/631 was subject to an amendment and extension planning application (PR 21/1478). This permitted development will be for alterations and extension to the solar PV and battery energy storage system development permitted under PR. 21/631. This extension will increase the area to be developed by ca.32.93ha for both solar PV and battery storage to the east and northeast of PR 21/631.

The Proposed Development will not supersede any part of Phase 2, but instead will facilitate the connection of it to the national grid.

### **Louth County Council Ref. No: 22/534 (Phase 3 –Granted )**

This permitted development is for a solar PV development to be developed as an extension of the solar PV development permitted under Ref. No. 21/631 on a site with a total area of ca.81.37ha.

The Proposed Development will not supersede any part of Phase 3, but instead will facilitate the connection of it to the national grid.

### **ABP SID Ref: ABP-315456-23)**

The background to this current 2 x110kV substation development is as follows.

Initially, it was considered by the technical advisors to Strategic Power Projects Limited that the 2 no. 37kV substations permitted under PR: 21/631 (Phase 1) and PR: 21/1478 (Phase 2), would facilitate connection of both phases to the national grid.

However, after the grant of PR 22/534 (Phase 3) the 37kV substation design solution was determined to be no longer capable of connecting all phases of the solar and battery storage development to the national grid.

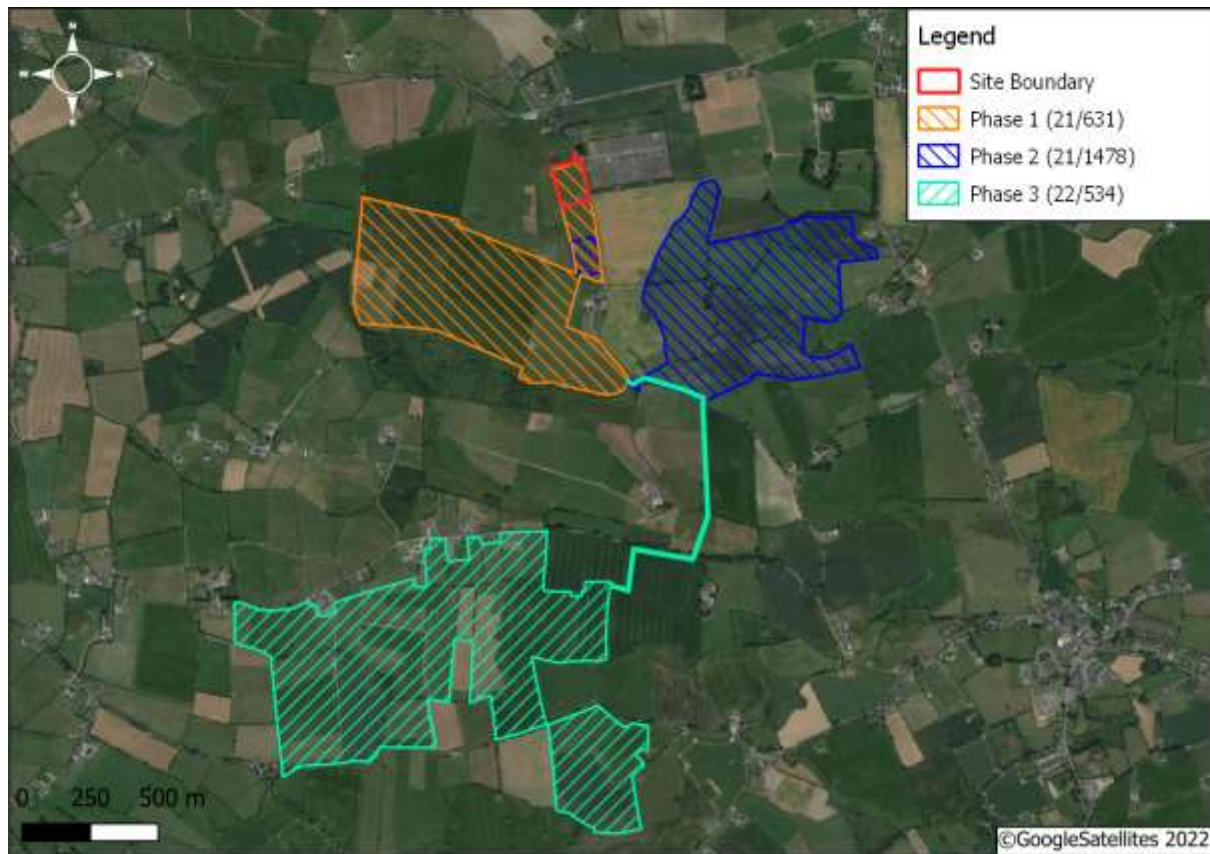
The technical advisers, therefore, designed a 220kV substation and grid connection to cater for all phases of the solar and battery storage development under one connection. As noted above, the 220kV substation design and associated SID Planning Application is currently under consideration by the Board (ABP SID ref: ABP-315456-23).

In support of the Pre-Consultation for this current SID application, the Board was advised that the final connection design is dictated by EirGrid. In September 2021 Strategic Power Projects Limited entered into the Enduring Connection Policy (ECP) process with EirGrid seeking a connection for Phase 1 of the development, as permitted under PR: 21/631.

Having progressed through this EPC process successfully, EirGrid made a connection offer to Strategic Power Projects Limited for Phase 1 which proposes a 110kV connection, this offer was only made in January 2023. Hazelboro Ltd. has now accepted the offer and this has now started EirGrid’s design process. EirGrid considers that a 220kV connection is, at this juncture, oversized for Phase 1 in isolation. It is EirGrid’s policy not to take into consideration future phases until such times as they have successfully passed through an ECP process. Phases 2 and 3 will take part in the ECP 2.4 process scheduled for Q4 this year, after which there will likely be two potential connections methods, i.e. either one single 220kV substation and connection or 2No. 110kV substations and associated 2No. underground connections.

To provide further context, in June 2022 Phase 1 of the project was also successful in the Renewable Electricity Support Scheme 2 (RESS2) auction and is now considered an urgent construction project. This is the reason why this current SID application is required by Hazelboro as it needs to have the option to implement this option as soon as possible, especially given it will not know the outcome of the ECP process for phases 2 and 3 until Q1 2024.

**Figure 1-2: Development Overview**



## 1.2 The Applicant

Please note that the Pre-Consultation with the Board in respect of this application (ref: ABP-315972-23) was made in the name of Strategic Power Projects Limited. Hazelboro Limited was set up by Strategic Power Projects as a Special Purpose Vehicle subsidiary to deliver this project. Therefore, Hazelboro Limited is now the applicant for this SID application.

### 1.3 Site Context

The Site is located within a predominately rural landscape, with Louth village centre ca. 2.5km to the south-east. The Site is ca.1.75ha in size, and currently comprises of an agricultural field and hedgerows.

The Louth ESB 275kV substation is located ca.45m east of the Site and will act as the connection point into the national grid. The lands to the south of the Site comprises mainly of agricultural lands, local roads with some residential dwellings as well as the permitted development (PR 21/631) and subsequent permitted extension (PR 21/1478). The immediate northern, southern and western boundaries of the Proposed Development are bound by agricultural fields, and the eastern boundary by a local road (L5141).

Due to the rural context of the area, the Site is currently well screened by natural boundaries such as hedgerows / treelines. Figure 1-2 Illustrates the red line boundary of the Proposed Development, the Permitted Developments (21/631, 21/1478 and 22/534).

### 1.4 Watercourses within the Vicinity of the Site

The Site is situated within the Newry, Fane, Glyde and Dee Catchment [Catchment\_ID: 06] and the Fane\_SC\_020 subcatchment [Subcatchment\_ID: 06\_13] [1].

No watercourses or drainage ditches were identified within the Site. However, as per EPA Maps [1], there are three (3No.) hydrological features of note in the vicinity of the Site (see Figure 1-3)

#### 1. Ballykelly River

The Ballykelly River is located ca. 270m north of the Site, situated across the R178. The Ballykelly River flows in an easterly direction and drains into the River Fane ca. 3.4km downstream of the Site. The River Fane forms part of the Dundalk Bay SAC and SPA, ca. 12km east of the Site.

Under the Water Framework Directive (WFD) 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [1]. According to the river waterbody WFD 2016-2021, the most up to date data at the time of this report, the water quality within the Ballykelly River is considered to be 'good,' and the status of this river is considered to be 'under review' [2].

#### 2. Carnalughoge Stream

The Carnalughoge stream is located ca. 415m east of the Site. This stream drains into the Carnalughoge River, traveling ca. 600m before discharging into the Ballykelly River, and eventually the River Fane and Dundalk Bay SAC and SPA.

Under the Water Framework Directive (WFD) 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [1]. According to the river waterbody WFD 2016-2021, the most up to date data at the time of this report, the water quality within the Carnalughoge Stream is considered to be 'good,' and the status of this stream is considered to be 'under review' [2].

#### 3. Tullycahan stream

The Tullycahan stream is located ca. 1km southeast of the Site. The stream drains into the Carnalughoge River, travelling ca. 600m, before discharging into the Ballykelly River, and eventually the River Fane and Dundalk Bay SAC and SPA.

Under the Water Framework Directive (WFD) 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [1]. According to the river waterbody WFD 2016-2021, the most up to date data at the time of this report, the

water quality within the Tullycahan Stream is considered to be ‘good,’ and the status of this stream is considered to be ‘under review’ [2].

**Figure 1-3: Watercourses in the vicinity of the Site**



## 1.5 Site Selection Process

A comprehensive site selection and due diligence process was undertaken in selecting the Site. As part of this assessment, a Site walkover of the landholding was undertaken. Some of the key site selection criteria included the following:

1. Proximity to the national grid as a number of overhead lines traverse the Site;
2. No Natura sites on the Site;
4. Low number of residential dwellings in close proximity to the Site; and,
5. Supportive landowner.

It was considered that the Site, which involves greenfield land, would be appropriate for the Proposed Development.

## 1.6 Community Engagement

During the design phase of the Overall Development, SPP and the project design team were cognisant of the local community and individual householders. SPP invested a lot of time and resources to pro-actively meet with all local residents in one- on-one meetings. In the event specific residents were not contactable, SPP left their contact details at the house to be contacted at a later date. This proactive community engagement helped create better visibility of the Applicants proposals early days for residents and helped the formulation of professional and sensitively designed development proposals. The benefit of this pro-active engagement was borne out in final grants of planning permission with no third-party appeals.

## 2 EIA SCREENING

An EIA screening assessment has been undertaken in accordance with Schedule 5 and Schedule 7 of the Planning and Development Regulations 2001 (as amended) and takes cognisance of Directive 2014/52/EU, as it is currently interpreted, utilising the following guidance:

- Environmental Protection Agency (EPA), Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR) 2022 [3].

### 2.1 Methodology

#### 2.1.1 Desk Based Studies

In undertaking this EIA Screening Assessment, a detailed desk-based study was completed that included a review of the following information:

- Relevant legislation and guidance; and,
- Relevant published information pertaining to the Site and surrounding area in regard to all of the stipulated EIAR topics.

#### 2.1.2 Legislative and Regulatory Context

EIA screening requirements derive from the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU). The amended EIA Directive came into force on 16<sup>th</sup> May 2017 and regulations transposing it into national legislation were signed into law on 19<sup>th</sup> July 2018 as the Planning and Development (Amendment) Act 2018 [4]. There are no changes to the prescribed project types or EIA thresholds under the amended EIA Directive 2014/52/EU. The project types and thresholds set out in the 2001-2010 Regulations remain in effect.

In order to determine whether it is required to undertake an EIA for the Proposed Development, the following legislation was consulted:

- The Planning and Development Regulations, 2001 (as amended) [5];
- EU Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment ('2014 EIA Directive') [6]; and,
- The Roads Act 1993 (as amended) [7].

In addition, the following guidance documents were reviewed:

- Interpretation of Definitions of project Categories of Annex I and II of the EIA Directive [8];
- European Commission (June 2017), Environmental Impact Assessment of Projects. Guidance on Screening [9];
- Department of the Environment, Heritage and Local Government (August 2003), Environmental Impact Assessment (EIA) Guidelines for Consent Authorities regarding Sub-threshold Development [9];
- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports [10]
- Department of Housing, Planning, Community and Local Government Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) - Circular 1/2017', 15th May 2017 [12]; and,

- Department of Housing, Planning and Local Government (DHPLG) Transposing Regulations (S.I. No. 296 of 2018) Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment [12]

### 2.1.3 Field Based Studies

A site inspection was undertaken by MOR Consultants on the 14<sup>th</sup> of April 2023 for the purpose of the EIA screening in order to gain a better understanding of the receiving environment and to identify any sensitive environmental receptors.

The first step in the assessment process was to examine whether the proposal is a project as understood by the Directive. Projects requiring environmental impact assessment are defined in Article 4, and set out in Annexes I and II, Schedule 5 of the Planning and Development Regulations, 2001 as amended. Section 5 of the Planning and Development Regulations 2001 (as amended) sets out the criteria for assessing whether or not a mandatory EIA is required for a development. It transposes Annex I and Annex II of the EU EIA directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the Schedule.

## 2.2 Assessment under Section 5 (Mandatory EIA)

The relevant references in respect of electricity transmission infrastructure in Part 1 of Schedule 5 are as follows:

- Part 1, Class 20: Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres.

A mandatory EIA, is not required given the following:

- All power lines for the grid connection will be underground and <15 kilometres.

Therefore, the Proposed Development subject to this EIA Screening Report **does not fall within the scope of activities listed in Part 1 of Schedule 5. Accordingly, mandatory EIA, as classified under Annex I, is not required.**

The relevant references in respect of Part 2 of Schedule 5 are as follows:

Under Part 2 3(B) ..... transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more. This will not be applicable as the transmission cables will be underground.

Under Part 2 10(b)(iv) of Schedule 5, in regard to *Infrastructure Projects*, with respect to the size and scale of the infrastructure project proposed, a Solar PV project could not be considered an “urban development” as specified. Therefore, mandatory EIA, as classified under Part 2 10(b)(iv) of Schedule 5 is not required;

Under Part 2.10(dd) of Schedule 5, in regards to *Infrastructure Projects*, with respect to “private roads which would exceed 2000 metres in length”, internal access road that will serve the Proposed Development will not exceed this length and would not be considered to be “private roads” in the meaning of this activity as it will not be accessible to the public and will be less than 2000m.

Therefore, mandatory EIA, as classified Under Part 2. 10(dd) of Schedule 5 is not required.

The Proposed Development will not result in a development of a class listed in Part 1, or paragraphs 1 to 9 and 11-12 of Part 2 of Schedule 5 of the Planning and Development Regulations, 2001, as amended.

Therefore, based on the findings of this EIA screening assessment, the Proposed Development **does not fall under the remit of Part 2 of Schedule 5 and accordingly a mandatory EIA is not warranted.**

Please note that similar screening conclusion have been upheld in the Courts as per Sweetman V ABP (2020) IEHC 39 and Kavanagh V ABP (2020) IEHC 259, which concluded that neither the Solar Farm nor the underground cables for grid connection required an EIA under Irish Planning Legislation.

### 2.2.1 Assessment under Section 7 (Significance)

Section 7 of the Planning and Development Regulations 2001 (as amended, 2015) sets out the criteria for assessing whether or not a project will have ‘likely’ and ‘significant’ effects on the environment. These criteria include the following:

- ‘Characteristics of Proposed Development;’
- ‘Location of Proposed Development;’ and,
- ‘Characteristics of potential impacts.’

These criteria were considered for the Proposed Development under the topics recommended in EIA guidance documents. A summary of this assessment is set out in Table 2-1.

**Table 2-1: EIA Screening Assessment**

Topic	Likely & Significant Effects	Comment
<b>Human Beings</b>	None	The Proposed Development will have no significant effects on the local population. It is considered that the Proposed Development will have a temporary, positive impact due to the provision of ca. 30 jobs during the construction phase of the Overall Development.  Any other potential effects on humans through visual impact, noise impact, and traffic are discussed and assessed in the relevant sections of this report.
<b>Biodiversity / Flora &amp; Fauna</b>	None	An ecological assessment has been undertaken, as presented in Chapter 6. The assessment concluded that the Proposed Development will not result in any significant impact on any protected or notable species and that it is considered that an overall positive impact will occur.  A NIS has been completed for the Proposed Development and should be read in conjunction with this report.
<b>Soils &amp; Geology</b>	None	Ground disturbance will be limited to minimal work to facilitate the enabling works and to shallow excavations for the installation of subsurface cabling, step up transformer units and associated infrastructure. Details of soil disposal are provided in Chapter 5.3 Construction Procedures. There will be no significant effects on soils and geology at, or in the general area of, the Site.
<b>Water</b>	None	A hydrological and hydrogeological assessment, which included a desk-based flood risk screening assessment, was undertaken and is referred out to for Chapter 7.  The assessment concluded that there is no flood risk at the Site and that the Proposed Development is not expected to result in any adverse impacts to the hydrological or hydrogeological regime of the receiving environment.

Topic	Likely & Significant Effects	Comment
<b>Noise</b>	None	A comprehensive Noise Assessment was undertaken for the Site and is presented in Chapter 8.  The assessment concluded that there are no significant noise sources associated with the Proposed Development. The Applicant is committed to ensuring that any noise is maintained below nuisance limits at sensitive receptors.
<b>Air Quality</b>	None	No significant emissions to air will occur due to the Proposed Development.
<b>Climate</b>	None	It is considered that the Proposed Development will have an overall slightly positive impact, as it will improve the national energy production through a renewable resource as discussed in Section 4.4 - Need for the Development.
<b>Landscape &amp; Visual</b>	None	A comprehensive Landscape and Visual Assessment was undertaken for the Site and is presented in Chapter 9.  The Proposed Development will not present significant Landscape & Visual impacts. A cumulative assessment of the Proposed and Permitted Developments was also undertaken. It is not considered that there will be any significant visual impacts arising from the Proposed Development.  This conclusion is based on the localised nature of the Proposed Development, the absence of visual receptors within the vicinity of the Site, and the screening provided by the surrounding landscape.
<b>Cultural Heritage</b>	None	An archaeological assessment has been undertaken, as presented in Chapter 10.  The assessment concluded that the Proposed Development will not result in any significant impact on any protected monuments or features in the wider area given that exclusion areas suggested by the archaeologist on basis of detailed geophysical survey and field inspection are adhered to.
<b>Material Assets - Traffic</b>	None	The Site will be accessed of the L5141 local road at the entrance of Phase 1 permitted development (PR 21/631).  Given the relatively short-term nature of the construction period (14 months), the existing road infrastructure and the limited number of vehicle movements during the operational lifetime of the Proposed Development, it was concluded that the potential impact on the local road network will be insignificant.
<b>Material Assets – Water</b>	None	Due to the infrequent use of the onsite buildings it is proposed to provide drinking water requirements by using bottled water.
<b>Material Assets – Wastewater</b>	None	Portable toilet facilities will be provided for workers during the construction phase and all associated waste will be disposed offsite by a suitably licensed waste contractor. As part of the operational phase of the substations a wastewater storage tank is to be provided and emptied by a licensed waste contractor.

Topic	Likely & Significant Effects	Comment
Material Assets – Waste	None	There will be no waste produced during the operational phase and minimal waste during the construction phase. Waste generated during the construction phase will be collected, accommodated and segregated onsite before being removed offsite and recycled or disposed of at a suitably licensed waste or treatment facility.

## 2.3 Environmental Report

Based on the findings of the EIA screening assessment it was concluded that the Proposed Development will not result in any likely and significant effects on the environment, therefore, an EIAR is not warranted.

In the absence of an EIAR and in order to prepare a comprehensive and robust application, this Environmental Report (ER) has been prepared having regard to the same guidelines applicable to EIA Projects.

On behalf of the Applicant, a Section 7 Assessment along with a number of environmental assessments will be undertaken in order to demonstrate the lack of potential environmental effects in the spirit of the EIA directive.

This ER has been prepared taking into account the following guidance documents:

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements [13];
- Guidelines on the Information to be contained in Environmental Impact Statements [14];
- Guidance on EIA: EIR Review [15]; and,
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities regarding Sub-threshold Developments [16].

The following new draft guidance documents have also been taken into account:

- Advice Notes for preparing Environmental Impact Statements Draft [17];
- Environmental Protection Agency (EPA), Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR) 2022 [11]; and,
- Circular letter PL 1/2017 - Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) - Advice on Administrative Provisions in Advance of Transposition.

Additional relevant specialist guidance documents were also used in the preparation of the individual assessments. These are detailed in the relevant appendices.

### 2.3.1 Scope of this ER

The following topics are presented in this ER.

- Proposed Development and Construction Stage Management;
- Biodiversity (Flora and Fauna);
- Water;
- Noise;

- Landscape and Visual;
- Cultural Heritage; and,
- Traffic.

### 3 METHODOLOGY

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes. This approach and methodology has been adopted throughout the Environmental Report, unless otherwise stated. Any differentiation has been outlined clearly in each specific chapter where relevant.

#### 3.1 Assessment of the Effects – Evaluation Criteria

The evaluation of significance considers the magnitude of the change and the sensitivity of the resource or receptor. The criteria for determining the significance of impacts and the effects are set out in Figure 3-1 and Table 3-1 below, taken from EPA Guidance, *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* [18]. Definitions of impact, as outlined by the EPA, are included below and unless otherwise stated within the specific ER Chapter these definitions apply throughout this ER.

**Figure 3-1: Determining Significance of Potential Effects**

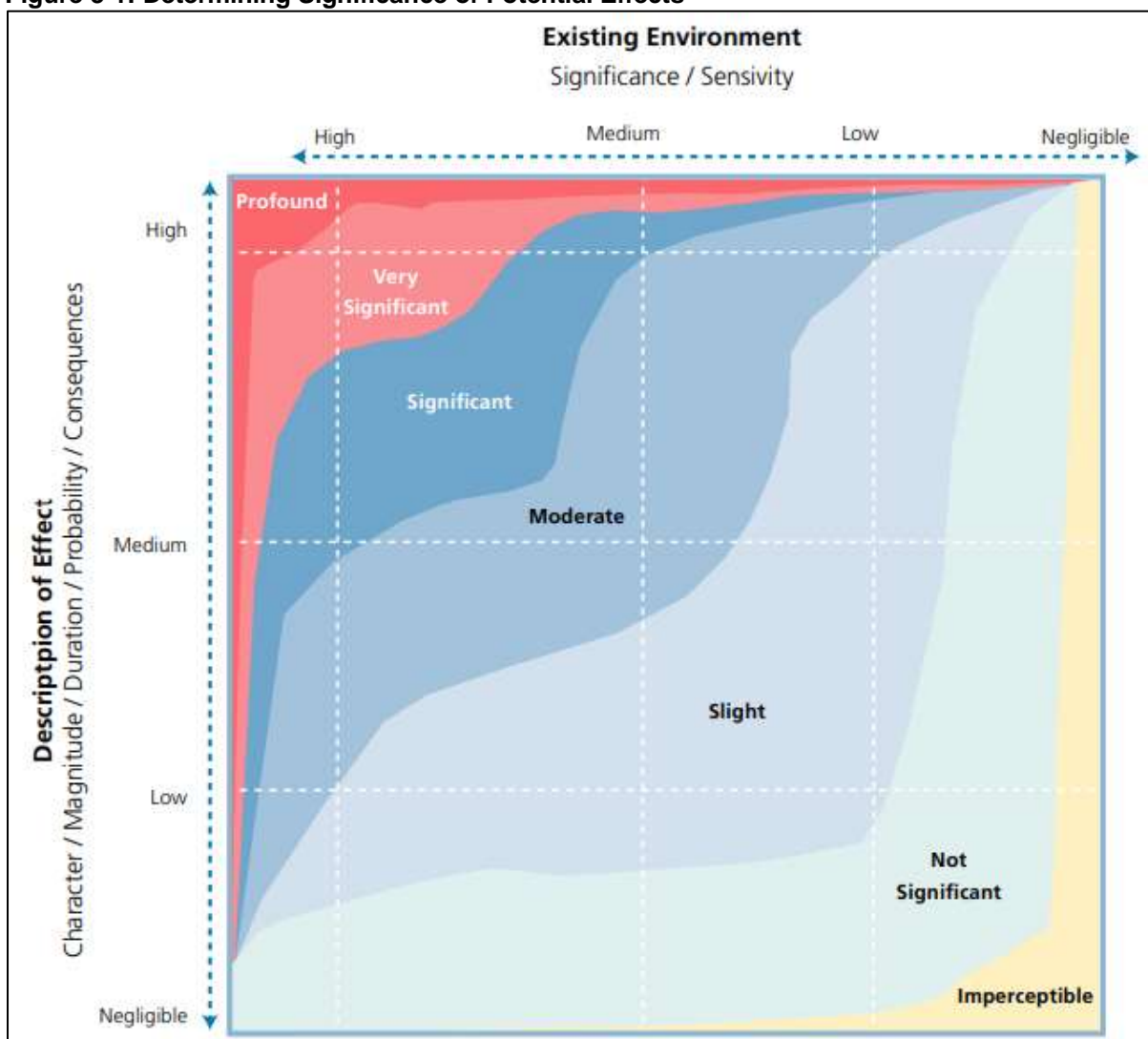


Table 3-1 defines the quality of effects from positive to negative on the environment.

**Table 3-1: Quality of Effects**

Type of Effect	Quality of Effect
<b>Positive Effects</b>	<i>A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities)</i>
<b>Neutral Effects</b>	<i>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</i>
<b>Negative / Adverse Effects</b>	<i>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).</i>

Table 3-2 outlines the definitions for significance of effect, which range from imperceptible to profound.

**Table 3-2: Describing the Significance of Effects**

Classification	Criteria
<b>Imperceptible</b>	<i>An effect capable of measurement but without significant consequences.</i>
<b>Not Significant</b>	<i>An effect which causes noticeable changes in the character of the environment but without significant consequences</i>
<b>Slight Effects</b>	<i>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</i>
<b>Moderate Effects</b>	<i>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</i>
<b>Significant Effects</b>	<i>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</i>
<b>Very Significant</b>	<i>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</i>
<b>Profound Effects</b>	<i>An effect which obliterates sensitive characteristics.</i>

Table 3-3 describes the terminology used to discuss the extent and context of effect of a Proposed Development on the environment.

**Table 3-3: Describing the Extent and Context of Effects**

Magnitude	Description
<b>Extent</b>	<i>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</i>
<b>Context</b>	<i>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).</i>

Table 3-4 shows how likely an impact is to occur.

**Table 3-4: Describing Probability of Effect**

Magnitude	Description
<b>Likely Effects</b>	<i>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</i>
<b>Unlikely Effects</b>	<i>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</i>

Table 3-5 discusses the duration and frequency of effects. Momentary effects lasting from seconds to minutes will often be less concerning than a long-term and permanent effects, depending on their severity.

**Table 3-5: Duration and Frequency of Effect**

Magnitude	Description
<b>Momentary Effects</b>	<i>Effects lasting from seconds to minutes.</i>
<b>Brief Effects</b>	<i>Effects lasting less than a day.</i>
<b>Temporary Effects</b>	<i>Effects lasting less than a year.</i>
<b>Short-term Effects</b>	<i>Effects lasting one to seven years.</i>
<b>Medium-term Effects</b>	<i>Effects lasting seven to fifteen years.</i>
<b>Long-term Effects</b>	<i>Effects lasting fifteen to sixty years.</i>
<b>Permanent Effects</b>	<i>Effects lasting over sixty years.</i>
<b>Reversible Effects</b>	<i>Effects that can be undone, for example through remediation or restoration.</i>
<b>Frequency of Effects</b>	<i>Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).</i>

Table 3-6 defines the types of effects that can potentially occur as a result of a Proposed Development.

**Table 3-6: Describing Types of Effects**

Magnitude	Description
<b>Indirect Effects (a.k.a. Secondary Effects)</b>	<i>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.</i>
<b>Cumulative Effects</b>	<i>The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.</i>
<b>‘Do Nothing Effects’</b>	<i>The environment as it would be in the future should the subject project not be carried out.</i>
<b>‘Worst case’ Effects</b>	<i>The effects arising from a project in the case where mitigation measures substantially fail.</i>
<b>Indeterminable Effects</b>	<i>When the full consequences of a change in the environment cannot be described.</i>

<b>Magnitude</b>	<b>Description</b>
<b>Irreversible Effects</b>	<i>When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.</i>
<b>Residual Effects</b>	<i>The degree of environmental change that will occur after the proposed mitigation measures have taken effect.</i>
<b>Synergistic Effects</b>	<i>Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).</i>

The above terminology will be used throughout this report unless superseded by an environmental topic best practice in assessing ER. Where specialist topics defer from these terms, a topic specific methodology will be provided for within the relevant chapter.

### **3.2 Assessment of Cumulative Impacts**

Cumulative impacts refer to impacts that result from incremental changes caused by other past, present, and approved developments, and as far as practicable from reasonably foreseeable development(s), together with the Proposed Development.

## 4 POLICY, PLANNING AND DEVELOPMENT

### 4.1 Introduction

This chapter provides a detailed description of the plans and policies that support the Proposed Development.

### 4.2 Planning History

There has been one previous planning application relating to the application Site.

- Planning permission was granted with Conditions for ca. 42ha site with Solar PV Farm, 133MW battery storage and two onsite substations in Toomes and Monvallet Co. Louth (PR: 21/631).

Further to this, there are three other associated planning applications.

- Planning permission was granted with Conditions (PR: 21/1478) for a Solar PV Farm extension to PR: 21/631, over ca.33ha and addition of 54no. battery storage units. Includes extensive Biodiversity Enhancement Area on 7.48ha. Located ca. immediately east of the Site.
- Planning permission was granted with Conditions (PR: **22/534**) by Louth County Council for a solar PV development to be developed as an extension of the Phase 1 solar PV development permitted PR 21/631 on a site with a total area of ca.81.37ha.
- Strategic Power Projects Limited awaits a decision on the proposed 220kV substation development on this site (ABP SID ref: ABP-315456-23). A revised date for a decision on or before 29th of August has been received from ABP.

#### Previous Solar Projects within County Louth

- Conditional planning permission was granted for a 4MW Solar PV Farm and substation in Willville, Dundalk, Co. Louth (PR: 16/524).
- Conditional planning permission was granted for a 4MW Solar PV Farm and substation in Drumcar Road, Co. Louth (PR: 17/332).
- Conditional planning permission was granted for a 20,000n. photovoltaic panels. Solar PV Farm (4MW) and substation on 8.91 ha Beaulieu, Drogheda Co. Louth (PR: 17/759).

### 4.3 An Bord Pleanála (ABP) Pre-application Consultations - Section 182E

The Applicant entered into pre-application consultation with the Board, as provided for in Section 182E of the Act in March 2023 (ABP Ref: 315972-23).

ABP formally confirmed on the 6<sup>th</sup> of June 2023 that the Proposed Development was strategic infrastructure in accordance with Section 182A of the Planning and Development Act, 2000, as amended (see Appendix B).

### 4.4 Need for the Development

#### 4.4.1 Global Context

Globally, there is clear recognition that action to mitigate climate change is necessary. This initially resulted in the Paris Agreement 2015 – an international effort to halt the global increase in temperature to below 2°C above pre-industrial levels. According to the Sixth Assessment Report (AR6) of the United Nations Intergovernmental Panel on Climate Change (IPCC), in order to achieve the 2°C objective, global greenhouse gas (GHG) emissions must be reduced by 55-90% by 2050 compared to 2019 and be near zero by 2100 [18]. Key to achieving this

level of emissions reduction will be the preparation and implementation of low carbon development strategies.

The EU target for 2030 was to achieve a 40% reduction in domestic GHG emissions compared to 1990 [20].

In November 2022, the United Nations Climate Change Conference (COP27), in Egypt, the participating countries reaffirmed these earlier commitments under the Paris Agreement (2016) to the temperature goal of holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial level. There was also the establishment of a fund to support countries facing “loss and damages” due to climate change. The UN also unveiled a \$3.1 billion plan to ensure everyone is covered by early warning systems in the next five-years to bolster the countries’ ability to prepare for hazardous weather. The European Union announced that it was going to further reduce emissions from 55% agreed at COP26 to 57% by 2030. The meeting also saw discussions regarding increasing deployment of renewable energy sources

In Ireland, wind accounted for 84% of renewable energy generation in 2021 [20]. Wind capacity increased average of ca. 12% each year from 2009 to 2019, but has slowed in recent years due to the profiling of renewable energy price support schemes. In 2022, the Government committed additional resources for 5,500MW of solar generation by 2030 to support Ireland’s need for greater renewable energy capacity, and to further accelerate the reduction of overall economy-wide emissions. In 2021, 41% of energy in Ireland was produced from natural gas, whilst wind accounted for 28%. Solar PV & thermal accounted for 1% of all energy produced in Ireland, lower than Waste (5%) and biofuel (2%) [20].

Provisional total national GHG emissions in 2022 (excluding land use land use change and forestry also know as LULUCG) are estimated to be 60.76 million tonnes (Mt) of carbon dioxide equivalent (CO<sub>2e</sub>), which is 1.9% lower than the 2021 figures [21]. Emissions are also 0.5% lower than pre-pandemic phases [21]. Energy Industries contributed to 16.4% of GHG emissions (excluding LULUCF) in 2022, compared to 1990 (20.4%) [21]. In 2022, overall electricity generation increased from 2.1%, due to the increased wind generated energy (14.6%) [21].

Developments such as the Proposed Development are not only essential to achieving renewable energy goals, but also to achieving the wider goal of decarbonising the economy in Ireland.

#### **4.4.2 European Green Deal**

Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Green Deal will transform the EU into a modern, resource-efficient and competitive economy, ensuring [24]:

- *No net emissions of greenhouse gases by 2050;*
- *Economic growth decoupled from resource use; and,*
- *No person and no place left behind.*

#### **4.4.3 EU Renewable Targets**

EU wants to accelerate the take-up of renewables to contribute and reach the goal of reducing net greenhouse gas emissions by at least 55% by 2030.

Increasing the share of renewable energy across the different sectors of the economy is therefore a key building block to reach the EU’s energy and climate objectives by cutting

greenhouse gas emissions by at least 55% (compared to 1990) by 2030 and becoming a climate neutral continent by 2050.

#### **4.4.4 Renewable Energy Directive 2018/2001/EU**

In December 2018, the recast Renewable Energy Directive 2018/2001/EU entered into force, as part of the Clean energy for all Europeans package, aimed at keeping the EU a global leader in renewables and, more broadly, helping the EU to meet its emissions reduction commitments under the Paris Agreement. Building on the 20% target for 2020, the recast Renewable Energy Directive 2018/2001/EU established a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.

On 21 July 2021, the Commission proposed a revision of the renewable energy directive in July 2021, as part of the package to deliver on the European Green Deal as detailed above. The proposal raises the ambition of the existing legislation to align it with EU's increased climate ambition and seeks to increase the current target to at least 40% renewable energy sources in the EU's overall energy mix by 2030.

It also seeks to introduce new measures to complement the already existing building blocks established by the 2009 and 2018 directives, to ensure that all potentials for the development of renewable energy are optimally exploited, to achieve the EU's objective of climate neutrality by 2050 [25]. The proposed revision of the directive is now being considered by the Council and the European Parliament. The adoption is expected by end of 2022.

#### **4.4.5 REPowerEU Plan**

On 18 May 2022, the Commission published the REPowerEU plan, which sets out a series of measures to rapidly reduce EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition. The REPowerEU plan is based on three pillars: saving energy, producing clean energy and diversifying the EU's energy supplies. As part of its scaling up of renewable energy in power generation, industry, buildings and transport, the Commission proposes to increase the target in the directive to 45% by 2030.

This would bring the total renewable energy generation capacities to 1236 GW by 2030, in comparison to 1067 GW by 2030 envisaged under the 2021 proposal. To further accelerate the deployment of renewables, the Commission also adopted a Recommendation to speed up permit-granting procedures for renewable projects and facilitate power purchase agreements.

#### **4.4.6 Energy Roadmap 2050**

The Energy Roadmap 2050 is the concluding policy framework proposal in a series produced by the European Commission to underpin European energy and climate change policies [26].

The Roadmap provides a framework in which the three aims of decarbonisation, security of supply and competitiveness in European energy policy could be realised.

Roadmap 2050 has concluded that Europe's energy production will have to be almost carbon-free in order to reach the Commission's latest target of reducing emissions by 80-95 per cent of 1990 levels over the next 38 years.

Recognising the difficulty of predicting energy futures with certainty, seven alternative illustrative scenarios have been developed. The first two present the likely outcome of doing no more than continuing with existing policies and current policy initiatives – both would fail to deliver the 2050 carbon reduction goals. The other five offer alternative pathways to the 2050 goal, based on different technology and policy options are as follows:

1. Very firm energy efficiency measures.

2. Strong use of carbon pricing to drive a variety of low carbon solutions to compete in the market place;
3. Extensive support measures for the development of renewable energies;
4. More nuclear and less carbon capture and storage (CCS); and,
5. More carbon capture and less nuclear.

#### **4.4.7 Irish National Policy**

##### **4.4.7.1 The National Planning Framework - Project Ireland 2040 (Ireland 2018)**

###### **National Strategic Outcome 8: Transition to a low-carbon and climate-resilient society**

Transitioning to a low-carbon and climate-resilient society and achieving sustainable mobility are vital strategic outcome identified in the NPF. This reflects the Government's 2014 National Policy Position on Climate Action and Low-Carbon Development which establishes the fundamental national objective of achieving transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050 [27].

The NPF states the objectives regarding renewable energy including:

- New Renewable Electricity Support Scheme (RESS) to support up to 4,500 megawatts of additional renewable electricity by 2030;
- Energy research funding to accelerate diversification away from fossil fuels to green energy, including wind, wave, solar, biomass, biofuels, biogas and hydrogen; and,
- Full roll-out of the new Support Scheme for Renewable Heat.

##### **4.4.7.2 The 2021-2030 Integrated National Energy and Climate Plan**

The European Union has taken a leading role in the fight against climate change by the five prime dimensions: energy safety, decarbonisation, energy efficiency, the energy internal market, and research, innovation and competitiveness.

The European Union has thus committed itself to leading energy transition globally by achieving the climate change targets of the Paris Agreement, which concern the supply of clean energy throughout the Union. In order to meet this commitment, the European Union has established energy and climate targets for 2030, as follows:

- The target of at least 40 % domestic reduction in greenhouse gas emissions by 2030, compared to 1990;
- The target of 32 % renewable energy consumption in 2030;
- The target of 32.5 % for improvements in energy efficiency in 2030; and,
- The 15 % electricity interconnection target by 2030.

Developments such as the Proposed Development are not only essential to achieving these energy and climate targets for 2030 but also to achieving the wider goal of decarbonising the electricity network and the economy in Ireland.

##### **4.4.7.3 The White Paper 'Ireland's Transition to a Low Carbon Energy Future 2015-2030'**

The White Paper sets out a vision and a framework to guide Irish energy policy between now and 2030. It is a complete energy policy update and its actions have been informed by the vision to transform Ireland into a low carbon society and economy by 2050, with 2030 representing a significant milestone. This includes the reduction of GHG emissions from the energy sector by between 80% and 95% (compared to 1990 levels) by 2050, while ensuring that secure supplies of competitive and affordable energy remain available to our citizens and businesses.

Chapter 5 of the White Paper ‘Delivering Sustainable Energy: Efficiency, Renewables, Technology’ sets out an overview of current and planned policies to progressively reduce Ireland’s dependence on fossil fuels and support sustainability through energy efficiency, renewable energy, and related technologies [28]. In this regard solar panel developments are considered an integral part of achieving this objective as stated below:

**Paragraph 137:** ‘Solar photovoltaic (PV) technology is rapidly becoming cost competitive for electricity generation, not only compared with other renewables but also compared with conventional forms of generation. The deployment of solar in Ireland has the potential to increase energy security, contribute to our renewable energy targets, and support economic growth and jobs. Solar also brings a number of benefits like relatively quick construction and a range of deployment options, including solar thermal for heat and solar PV for electricity. It can be deployed in roof-mounted or ground-mounted installations. In this way, it can empower Irish citizens and communities to take control of the production and consumption of energy. Solar technology is one of the technologies being considered in the context of the new support scheme for renewable electricity generation which will be available in 2016.’

#### **4.4.8 Irish National Policy for Renewable Energy**

##### **4.4.8.1 Strategy for Renewable Energy 2012-2020**

The strategy was published by DCENR in May 2012, sets out broad policy for the sector, including reiterating the Government’s firm view that:

*“...the development and deployment of Ireland’s abundant indigenous renewable energy resources, both onshore and offshore, clearly stands on its own merits in terms of the contribution to the economy, to the growth and jobs agenda, to environmental sustainability and to diversity of energy supply.”*

Use of indigenous renewable energy improves security of supply, reduces dependence on imported fossil fuels and reduces greenhouse gas emissions.

##### **4.4.8.2 National Energy & Climate Plan (NECP) 2021-2030**

This 2019 National Energy and Climate Plan (NECP) was prepared in accordance with Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action to incorporate all planned policies and measures that were identified up to the end of 2019 and which collectively deliver a 30% reduction by 2030 in non-ETS greenhouse gas emissions (from 2005 levels).

##### **4.4.8.3 National Renewable Energy Action Plan (NREAP)**

Each EU Member State was required, by the Renewable Energy Directive 2009/28/EC, to make a National Renewable Energy Action Plan (NREAP). Ireland’s NREAP was produced in 2010 and sets out the actions to reach the legally binding targets for energy consumed from renewable sources, 16% in Ireland by 2020.

This obligation is to be met by contributions of energy from renewable sources of 10% in transport, 12% in heating and 40% in electricity. The National Renewable Energy Action Plan (NREAP) sets out the Government’s strategic approach and concrete measures to deliver on Ireland’s 16% target under Directive 2009/28/EC.

The Government’s commitment to accelerating the development of renewable energy is set out in the Government’s Energy Policy ‘Delivering a sustainable energy future for Ireland – The Energy Policy Framework 2007-2020’; the Programme for Government and in the Government’s strategy ‘Building Ireland’s Smart Economy – A Framework for Sustainable Economic Renewal.’

#### 4.4.9 Climate Action Plan 2023

The Climate Action Plan 2023 is the second annual update to Ireland’s Climate Action Plan 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021.

The plan implements the carbon budgets and sectoral emission ceilings and sets out a roadmap for taking decisive action to halve our emission by 2030 and reach net zero no later than 2050, as committed to in the Programme for Government [28].

It outlines the current state of play across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and charts a course to achieve an ambitious net zero emissions target by 2050 [28].

Decarbonising electricity is at the centre of the Climate Action Plan strategy. The share of electricity from renewable energy increased from 7.2% to 33.7%, an increase of 26%, between 2005 and 2018 [28]. Demand for electricity is forecast to increase by between 19% and 50% above existing capacity in the next decade in line with economic forecasts. Ensuring we build renewable, rather than fossil fuel generation capacity to help meet this demand is essential. It makes economic sense and also facilitates decarbonising our heating and transport through electrification.

The renewables sector is very dynamic in nature, with technologies still rapidly evolving. Ensuring increased levels of renewable generation will require substantial new infrastructure, including wind and solar farms, grid reinforcement, storage developments, and interconnection:

*‘Increasing the share of electricity demand generated from renewable sources to up to 80% where achievable and cost effective, without compromising security of electricity supply’*

As renewable generation is intermittent and often unpredictable, this creates new challenges for utilities, market participants, and policy makers. Intermittency also creates the need for a range of technology solutions, which include large-scale interconnection, storage, and dispatchable capacity [28]. Up until recently, intermittency was a key obstacle to expansion of renewable electricity, especially wind, and therefore fossil fuels continue to be the dominant electricity generating technology.

To meet these targets, it will be essential to deliver at least 2 GW of additional gas generation capacity by 2030 to ensure security of supply, underpin our increased renewable targets, and give investment certainty. In general, increased use of variable renewable electricity generation will require continued improvements in areas such as power system stability, network loading, and constraints.

Specific actions for the electricity sector, with the aim of keeping Ireland on target for our 2030 decarbonisation ambitions, are set out in the Climate Action Plan, 2023. Specifically, the following actions:

**Table 4-1: CAP Actions**

<b>EL/23/1</b>	<i>Establish a taskforce to accelerate renewables.</i>
<b>EL/23/2</b>	<i>Publish the Renewable Electricity Spatial Policy Framework</i>
<b>EL/23/3</b>	<i>Publish a roadmap for the development and implementation of Regional Renewable Electricity Strategies</i>

<b>EL/23/6</b>	<i>Ensure electricity generation grid connection policies and regular rounds of connection offers which facilitate timely connecting of renewables, provides a locational signal and supports flexible technologies</i>
<b>EL/23/10</b>	<i>Ensure onshore and offshore RESS auctions as per the annual RESS auction calendar</i>
<b>EL/23/14</b>	<i>Ensure that hybrid technologies grid connections are facilitated, and remaining barriers removed</i>
<b>EL/23/21</b>	<i>Carry out further studies to identify the investments and upgrades needed to facilitate 80% renewable electricity annual share</i>
<b>EL/23/22</b>	<i>Publish a policy framework for electricity storage based on electricity system needs</i>
<b>EL/23/24</b>	<i>Complete and publish Electricity Demand Side Strategy and Implementation Plan</i>

#### **4.4.10 Renewable Electricity Support Scheme**

The Climate Action Plan 2023 provides that Ireland will be increasing the share of electricity demand generated from renewable sources as detailed in section 4.4.10 above. This will be mainly delivered through auctions under the Renewable Electricity Support Scheme (RESS) where electricity technologies will compete with each other on cost through competitive auctions to reach the above target.

RESS provides support to renewable electricity projects in Ireland and delivers a broader range of policy objectives, including:

- *An Enabling Framework for Community Participation through the provision of pathways and supports for communities to participate in renewable energy projects;*
- *Increasing technology diversity by broadening the renewable electricity technology mix;*
- *Delivering an ambitious renewable electricity policy to 2030; and,*
- *Increasing energy security, energy sustainability and ensuring the cost effectiveness of energy policy.*

As required under Article 6 of the Renewable Energy Directive, Ireland has published a Renewable Electricity Support Scheme - Schedule of Future Auctions, and outlines indicative volumes based on estimated renewable generation volumes required to meet Irelands targets by 2030. Indicative Auction Volume (GWh) are 7,500-10,000 for Q4 2022 [30].

#### **4.4.11 Louth County Development Plan (CPD) 2021-2027**

The core objective of the CDP is to demonstrate consistency with higher order spatial plans at national and regional level.

At the outset the CDP highlights the increased emphasis on a number of key issues, including renewable energy.

Amongst the Strategic Objective of the CDP are:

**Strategic Objective 4** which seeks to:

*“Transition to a low carbon and climate resilient County supporting energy efficiency and reducing energy demand, through a combination of mitigation and*

*adaptation responses to climate change. This includes for increased usage of renewable energy through developing indigenous energy resources, supporting the transition to a low carbon economy by 2050, and ensuring flood risk management. The Council will work with other bodies and organisations as appropriate, to identify and help protect critical infrastructure.”*

**Strategic Objective 5** which seeks to:

*“Ensure a more sustainable and integrated concept of development with regard to land use, transportation, water services, energy supply and waste management over the lifetime of the Plan”;*

**Strategic Objective 13** which seeks to:

*“Support the sustainable development of rural areas that are under strong urban influence to avoid over-development, while sustaining vibrant rural communities.”; and,*

**Strategic Objective 19** which seeks to:

*“Afford suitable protection to the environment and natural resources of the County and ensure the fulfilment of environmental responsibilities.”*

Through the CDP, the Council is committed to supporting investment in renewable energy and to developing a robust and sustainable Renewable Energy Strategy (RES) for the County.

To this end there are a number of specific CDP objectives which support solar development, including.

**Infrastructure and Public Utilities Objective IU64** which seeks to:

*“Support the development of solar energy infrastructure in the County including commercial scale ground mounted solar PV “Solar Farms” subject to environmental safeguards and the protection of natural and built heritage features, biodiversity and views and prospects”.*

**Infrastructure and Public Utilities Objective IU65** which seeks to:

*“Encourage and support the development of solar energy infrastructure for onsite energy use, including solar PV, solar thermal and seasonal storage technologies”.*

#### **4.4.12 Renewable Energy Generation and security of supply**

As discussed throughout section 4, The Irish government, as per the Climate Action Plan, has recognised the necessity of rapid decarbonisation of our electricity supply through renewable energy to prevent climate breakdown.

Furthermore, it should also be noted that a recent communication from the European Commission (REPowerEU: Joint European Action for more affordable, secure and sustainable energy) noted that developments in energy markets in recent months, especially due to the dramatic change in the security situation due to the invasion of Ukraine by Russia, require an acceleration in the clean energy transition and thereby increase Europe’s energy independence. The communication sets out new actions to ramp up the production of green energy, including Solar PV.

In addition and as outlined in the Louth CDP, the Council acknowledges that it needs to play its part in realising national targets and this will be achieved through the inclusion of supporting policy objectives for renewable energy generation and development.

The proposed development is fully in line with all EU, National and local policies in terms of renewable energy generation and will help position the Country as a leader in renewable energy generation while supporting energy efficiency and conservation.

#### **4.5 Need for the Proposed Development**

The Proposed Development will connect a large renewable energy project with the national grid. This will provide much needed green electricity to the grid to assist in decarbonising the Irish electrical network. This will include 75ha of permitted solar development providing an estimated ~65MW and 285MW from BESS. It is also intended that the Proposed Development will connect to the final phase of this solar development, granted under PR 22/534, and will provide an additional ~72MW, bringing total supply from the solar development to 137MW of electricity. This amount of renewable energy requires a 220kV connection to the grid, which will be achieved by connecting 2No. 110kV underground grid cable connections to the substations. The entire Hazelboro Limited development in Monvallet, if all permitted, will utilise the full capacity a 220kV bay in the Louth 275kV substation. In order to deliver the permitted and proposed renewable energy projects there is a clear technical need for the Proposed Development.

## **5 PROPOSED DEVELOPMENT DETAILS**

### **5.1 Permitted Developments**

The Proposed Development is in lieu of the 2No. 37kV substations permitted under Phase 1 (PR, 21/631).

### **5.2 Description of the Proposed Development**

#### **5.2.1 2No. 110kV Substation**

The proposed 2No. 110kV electrical substation's with customer and EirGrid compounds and 110kV grid connections will consist of:

- Internal section of access road to the sub-station buildings, compounds, parking, electrical apparatus, plant and equipment; overhead and underground electrical and communications cabling;
- 2No. IPP buildings (modular steel construction) measuring ca. 18.5m x ca. 5.5m x ca. 4.9m (height), 2No. Power Transformers, 4No. House Transformers (House TX), parking, compound and associated works;
- 1No. EirGrid control building (masonry construction) measuring ca. 25.0m x ca.18.0m x ca. 8.8m (height), parking, compound and associated works;
- Electrical apparatus, plant and equipment; overhead and underground electrical and communications cabling and associated works;
- 2No. interface kiosks;
- Fencing, gates, 9No. lightning masts and 12No. lamp standards; and
- all associated works.

The proposed underground cabling (110kV) and ducting will extend from the proposed substation site to the existing Louth (Monvallet) 275kV ESB substation site boundary on the opposite side of the L5141 road.

The proposed Site Layout is illustrated in Appendix A.

### **5.3 Site Access and Egress**

There will be one access point as part of the Proposed Development (See Figure 5-1 and 5-2). This access was granted as part of PR 21/631. The permanent site entrance is to be provided to the south of the proposed substation site and will be completed at the earliest stage of the proposed Construction Phase.

It is proposed that the access to the Proposed Development will remain as per the Phase 1 permitted development (PR 21/631) via the L5141.

The L5141 runs north to south and is, on average, 5m wide. The speed limit on this local road is 80km/h. The L5141 provides adequate stopping site distance and satisfies current standards. This site access is also in accordance with all sightline visibility requirements, as set out by Louth County Council, of 75m for a rural road with an 80km/h speed limit, measured from a 3m set-back from the road edge. The sightlines to the proposed access will be in excess of the stipulated 75m and therefore no improvements will be required. Refer to drawing P704\_P within the drawing pack submitted with this application.

Figure 5-1: Site Access – Excerpt Drawing P704\_P (PR 21/631)



Figure 5-2: Site Access



## 5.4 Grid Connection

The grid connection that will link the Proposed Development with the Louth ESB 275kV Substation directly east will consist entirely of underground cables that will be installed within the Site before traversing beneath the L5141 into the Louth ESB substation.

The operators of the Louth ESB substation will ultimately be responsible for ensuring that the most appropriate connection option will be selected.

## 5.5 Drainage

There are no drainage ditches located within the proposed Site boundary.

### Surface Water Drainage

A SuDS approach is proposed for the surface water drainage. Rainfall runoff from the Control building roof in the substation will be collected and piped to a rainwater harvesting tank for reuse in the onsite toilets. As water use for flushing toilets will be very low due to the infrequent use of the building, the majority of rainwater from the roof will drain into a proposed soak away. As there is no requirement for grey water in the IPP buildings the run off from the roof will be collected and piped directly to the soak away pit.

The Proposed Development access road shall be surfaced with a layer of permeable stone hardcore. This free draining material will allow rainfall to permeate into the ground. A small proportion of the access roads on site will be surfaced in concrete. The surface water run-off from this area will drain freely into the surrounding free draining areas which will be constructed in hardcore stone. The remainder of the hardcore stone material and the rainfall in these areas will permeate through the stone into the ground as per the green field conditions.

### Foul Water Drainage

It is expected that the facility will be unoccupied for the majority of their service life. However for design purposes, it was assumed that a maximum projected attendance at Site and in these buildings will be 2 to 3 people for one day every fortnight.

The predicted irregular foul loading due to the sporadic occupancy of the buildings creates unsuitable conditions for a wastewater treatment system. It is proposed therefore to pipe the foul water to a 2,800-litre tank for temporary holding storage. A maintenance agreement will be entered with a suitably licensed waste contractor for periodic (3 months) emptying of this tank. The maximum predicted flow into the tank every 3 months is:

- 3 people x 100 l/person/day (Factory with Canteen) = 300 l/day.
- 300 (1 day every 2 weeks) x 13 weeks = 1,900 litres.

Therefore, a 2,800-litre tank that will be emptied every 3 months will provide ample capacity to store the foul water.

## 5.6 Earthworks

Localised levelling works will be required for the development of the Site. The substations will comprise of a concrete foundation for the transformers and electrical equipment, with the rest of the area filled with crushed rock. It is estimated that the majority of the excavated materials will be within the Site or alternatively within the adjoining solar farm for the purpose of constructing screening berms given the overall development will be constructed as a single construction project.

## 5.7 Water Supply

Water for onsite welfare facilities will be provided by a 1,500 litre rainwater harvesting tank which will be filled from roof runoff. Working with projected usage of the sanitary facilities of 1,950 litres every 13 weeks, the rainwater storage tank will provide for up to 10 weeks without receiving any rainfall.

## 5.8 Sensitive Design

Specialist ecological input was a key element of the proposed design, to ensure that the design of the proposed infrastructure works was extremely sensitive to valued ecological features that occur or may occur within the Site and the surrounding landscape. The key measures relevant for this project have been detailed below:

- The construction and maintenance of the Proposed Development will use the approved access as per PR 21/631 which utilises the existing farm access point. Options to access the Site have been carefully considered to ensure safe access to the Site;
- Buffers will be implemented and maintained throughout the lifecycle of the Proposed Development including:
  - A 6m buffer between all works, substations infrastructure and existing hedge / trees lines; and,
  - A 5m setback from the perimeter fence and all the substations infrastructures.

## 5.9 Construction Procedures

During the construction phase potential environmental effects will be short-term and localised. Nonetheless, all works will comply with the relevant legislation, construction industry guidelines and best practice to reduce potential environmental adverse effects. A Preliminary Construction Environmental Management Plan (pCEMP) will be submitted with the overall planning application. This pCEMP will be a 'living document' and a final CEMP will be issued by the appointed contractor prior to construction commencing.

It is intended for there to be a single construction programme for the Permitted Developments and the Proposed Development.

A Construction Environmental Management Plan (CEMP) will be prepared by the appointed contractor and will be submitted to the planning authority in advance of works commencing at the Site. The following guidance will be referred to and will be followed during the construction phase of the project to prevent water pollution that may occur within the area:

- C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [31];
- C741 - Environmental Good Practice onsite (4th edition) [32];
- Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes [33];
- Guidance for the Treatment of Bats Prior to the Construction of National Road Schemes [34];
- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads [35];

- All works will be undertaken in accordance with the Inland Fisheries Ireland (IFI) 'Requirements for the Protection of Fisheries Habitat during Construction and Development' [36]; and,
- BS 5228-1+A1:2014: Code of Practice for noise and vibration control on construction and open sites- Part 1: Noise [37] and Part 2 Vibration [38];
- Inland Fisheries Ireland (IFI) 'Requirements for the Protection of Fisheries Habitat during Construction and Development' [36]; and,
- The recommendations included within the National Roads Authority (NRA) Guidelines for the Crossing of Watercourses [39].

The full scope and what is to be included in the CEMP will be refined following receipt of additional information with regards to the Proposed Development.

#### Soil Re-use

Localised levelling works will be required for the development of the Site. The substations will comprise of a concrete foundation for the transformers and electrical equipment, with the rest of the area filled with crushed rock. It is proposed that the majority of the excavated materials will be reused within the Site or alternatively within the adjoining solar farm for the purpose of constructing screening berms given the overall development will be constructed as a single construction project.

#### Duration and Timing of Works

The proposed works will take approximately 14 months to complete. Working hours will generally be restricted to between 07:00 and 19:00 Monday to Friday and between 07:00-13:00 on Saturdays.

### **5.10 Monitoring**

The construction works will be subject to periodic monitoring by an appointed Ecological Clerk of Works (ECoW), to ensure that the works will be completed in line with the measures and recommendations made within this ER and the pCEMP.

In addition, the ECoW will either deliver or provide the resident engineer with sufficient environmental information to deliver a Site induction to all personnel working on the Site.

### **5.11 Operational Procedures**

Once operational, significant maintenance works will not be required. The Proposed Development will be an unmanned facility, which will be remotely monitored by way of CCTV. Any fault flagged on the control system will be inspected by maintenance personnel or dealt with remotely if possible. All systems onsite will be automated, with remote access provided to the control building.

The Proposed Development will require as low as one maintenance visit per year to undertake routine, non-intrusive maintenance tasks such as Site inspection, cable and power plant checks and servicing, cleaning of panels, hedgerow maintenance etc. Only small vans / jeeps will be used to access the Site.

The transformer units will contain oil that will be banded. Under normal operation, this oil will be maintained within the system and no emissions will occur. To prevent unforeseen impacts on the environment the transformer and step-up transformer units will be monitored and maintained.

## 5.12 Waste Management

- All excavated materials will be reused onsite;
- Waste materials from grid connection trenching will be collected and stored in suitable receptacles before they will be taken offsite transported to a suitably licensed waste facility in strict accordance with all requirements of the Waste Management Act and subsequent regulations.
- Waste materials will not be allowed to accumulate because of the fire/vermin risk; and,
- All wastes will be appropriately segregated with the objective to maximise the level of recycling.

There will be no operational waste associated with the Proposed Development with the exception of the foul wastewater that will need to be removed periodically from the storage tank by a licensed contractor. The decommissioning plan prepared as part of the overall planning application addresses all aspects of waste management post the operational phase.

## 5.13 Decommissioning

The operation of the facility will be for approximately 35 years as determined by the grant of planning. At this time, a decision will be made as to whether the solar farm that will be connected to the Proposed Development will be decommissioned. If the decision is taken to decommission the solar farm, then the Proposed Development will also be decommissioned, and the Site returned to agricultural usage. However, if the solar farm were to be repowered, then the Proposed Development would remain in use.

It is intended for there to be a single decommissioning programme for the Permitted Developments and the Proposed Development.

The decommissioning tasks and removal of all solar farm components from the leased land will be completed within twelve months of the cessation of electricity generation by the solar farm and the Site shall be reinstated to its former use.

At the end of the Proposed Development's lifetime, the substations will be completely dismantled (including underground electrical interconnection and distribution cables) and the Site will be restored to its preconstruction state.

The decommissioning plan addresses all aspects of waste management post operational phase. The Applicant will re-use or recycle as many of the substations components as reasonably practicable. All residual waste will be removed by a licenced contractor and transported to a licenced waste facility.

Given the nature of the Proposed Development and the small amount of infrastructure required, it is considered highly unlikely that any adverse effects would occur as a result of decommissioning works. However, decommissioning works will have to be carried out in accordance with best practice and any legislation applicable at the time of decommissioning.

Full details of the decommissioning works are included within the 'Decommissioning Plan' submitted as part of the overall planning application.

## 6 BIODIVERSITY

This chapter of the report provides a description and assessment of the potential, likely and significant impacts of the Proposed Development on ecology.

A detailed Ecological Appraisal of the Site has been carried out by a team of fully qualified and experienced ecologists. In addition, an assessment on potential impacts on Natura 2000 sites was also undertaken and is presented in the Stage 2: Appropriate Assessment – Natura Impact Statement (NIS), which should be read in conjunction with this chapter.

### 6.1 Methodology

#### 6.1.1 Legislation Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded some degree of legal protection, for details see Box 1 below.

A study of biodiversity related planning policy at the national and local level has been undertaken for the Site and locality in order to highlight any potential conflicts with the relevant legislation and guidance documents.

#### **Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species**

The National Parks and Wildlife Service (NPWS) notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation (SACs) and Candidate Special Area of Conservation (cSACs): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021.
- Special Protection Areas (SPAs) and candidate Special Protected Areas (cSPAs): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- Natural Heritage Areas (NHAs): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas (pNHAs): these sites are not afforded the same protection as NHAs. These sites are proposed by the NPWS but are not statutorily proposed or designated. Prior to statutory designation these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this chapter

#### **Legally protected species**

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora Protection Order 1999.

#### **Other notable habitat/species categories**

- Biodiversity Action Plan (BAP) species: those targeted in local or national BAPs as being of particular conservation concern (priority species);
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland [40]; and,
- Other Irish Red Data Book species and Nationally/Regionally/Locally Notable species where appropriate.

## 6.1.2 National Planning Context

### 6.1.2.1 Planning Policy Statement

The National Planning Framework - Project Ireland 2040 [41] states the following objectives, in relation to Biodiversity:

#### **National Policy Objective 59:**

*‘Enhance the conservation status and improve the management of protected areas and protected species by:*

- *Implementing relevant EU Directives to protect Ireland’s environment and wildlife;*
- *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*
- *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;*
- *Continued research, survey programmes and monitoring of habitats and species.’*

#### **National Policy Objective 60:**

*‘Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance.’*

## 6.2 Local Planning Context

### 6.2.1 Louth County Development Plan 2021-2027

The Louth County Development Plan (LCDP) 2021-2027 [42] has a variety of statements in different sections which relate directly to biodiversity in this context.

In the Natural Heritage, Green Infrastructure and Biodiversity section:

**NBG 3** *‘To protect and conserve Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated under the EU Habitats and Birds Directives’.*

**NBG 4** *‘ To promote and implement the objectives of the Local Biodiversity Action Plan for County Louth 2021 - 2026 and any subsequent Louth Biodiversity Action Plan published during the life of this Plan.’*

**NBG 4** *‘To ensure that all proposed developments comply with the requirements set out in the DECLG ‘Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities 2010’*

**NBG 5** *‘To ensure that no plan, programme, or project giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan, either individually or in combination with other plans, programmes or projects.’*

**NBG 6** *‘To ensure a screening for Appropriate Assessment (AA) on all plans and/or projects and/or Stage 2 Appropriate Assessment (Natura Impact Report/ Natura Impact Assessment) where appropriate, is undertaken to make a determination. European sites located outside of the County but within 15km of the proposed development site shall be included in such screenings as should those to which there are pathways, for example, hydrological links for potential effects..’*

**NGB 7** *‘To co-operate with the Regional Planning Authority and adjoining local authorities, public agencies and community interests to protect regionally significant heritage assets, environmental quality and to identify threats to existing environmental quality in a transboundary context throughout the region.’*

**NGB 9:** *‘To ensure that proposals for development, where appropriate, protect and conserve biodiversity sites outside designated sites and require an appropriate level of ecological assessment by suitably qualified professionals to accompany development proposals likely to impact on such sites.’*

**NGB 10** *‘To ensure that development proposals, where relevant, improve the ecological coherence of the Natura 2000 Network of European sites and encourage the retention and management of landscape features as per Article 10 of the Habitats Directive.’*

**NGB 11** *‘Where feasible, ensure that no ecological networks, or parts thereof, which provide significant connectivity between areas of local biodiversity, are lost without remediation as a result of implementation of this Plan.’*

**NGB 12** *‘Prevent and control the spread of invasive plant and animal species within the County.’*

**NGB 31** *‘Where in exceptional circumstances, trees and or hedgerows are required to be removed in order to facilitate development, this shall be done outside nesting season and there shall be a requirement that each tree felled is replaced at a ratio of 10:1 with native species and each hedgerow removed is to be replaced with a native species. In Drogheda and Dundalk, replacement trees will be required at a ratio of 5:1 where the removal of trees is required in order to facilitate development.’*

**NGB 33** *‘To assess the implications of proposed development on significant trees and hedgerows located on lands that are being considered for development, seeking their incorporation into design proposals where appropriate and in compliance with procedures detailed in Appendix 6.’*

**NGB 34** *‘To increase native tree coverage in the County to also act as carbon sinks by promoting the planting of suitable native trees and hedgerows along public roads, residential streets, parks and other areas of open space.’*

### **6.2.1.1 Local Biodiversity Action Plan for County Louth 2021-2026**

Louth County Council has developed a Biodiversity Action Plan 2021 -2026 (BAP). The BAP is based off the National Biodiversity Action Plan 2017 – 2021 [43], but integrates the national objectives into a local context for Louth County.

The draft plan focuses on the several broad objectives, the following of which are relevant to the proposed development:

**Objective 1** *‘Mainstream biodiversity into decision-making across all sectors.’*

**Objective 2** *‘Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity.’*

**Objective 4** *‘Conserve and restore biodiversity and ecosystem services in the wider countryside.’*

**Objective 6** *‘Expand and improve management of protected areas and species.’*

### **6.3 Methodology Desk Study**

The following literature sources were checked for ecological information:

- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (<https://www.npws.ie/>) [44];
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to species distributions (<https://maps.biodiversityireland.ie/Map>) [45]; and,
- The EPA Envision website was consulted to obtain details about watercourses in the vicinity of the Site (<https://gis.epa.ie/EPAMaps/>) [2].

## 6.4 Field Survey

An initial Site assessment was undertaken on 23<sup>rd</sup> October 2020 by one (1No.) suitably qualified and experienced MOR ecologist to establish baseline conditions onsite. During this assessment, a habitat survey was undertaken at the Site using the Heritage Councils 'A Guide to Habitats in Ireland' [46]. This is the standard habitat classification system used in Ireland and includes both a desk based and field-based assessment.

Updated field surveys were also undertaken on 2nd March 2021, 28th September 2022 and 14th of April 2023 by two (2No.) suitably qualified and experienced MOR ecologists.

The assessments were extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation.

## 6.5 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types present indicated could occur on the Site.

### 6.5.1.1 Amphibians

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians. These included water bodies suitable for egg-laying, and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or water body margins. Suitable well drained and frost-free areas are needed to enable amphibians to survive the winter.

### 6.5.1.2 Badger

Specialist badger surveys were undertaken at the Site as part of Phase 1 permitted development (PR 21/631). The updated field surveys aimed to identify and examine areas where badgers (*Meles meles*) might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Latrines; and,
- Badger setts.

### 6.5.1.3 Bats

An initial assessment was carried out during the habitat survey for suitability of the habitats within the Site to support bat roosting, foraging and commuting. Mature trees were noted and

inspected for evidence of cavities, splits, cracks, loose bark and dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting.

#### **6.5.1.4 Birds**

The Site was assessed for its potential to provide a nesting habitat for breeding birds or to support important assemblages of birds of rare or notable species.

#### **6.5.1.5 Invasive species**

The Site was assessed for the presence of any noxious / invasive species such as Japanese knotweed (*Fallopia japonica*) and any other invasive species.

#### **6.5.1.6 Other Species**

In addition, an assessment was carried out for the potential of the Site to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally by the desktop study.

### **6.6 Survey Limitations**

No survey limitations were encountered.

### **6.7 Assessment Methodology**

The starting point for the assessment was to undertake a scoping exercise for those ecological receptors that would require further consideration as part of the assessment. This involved differentiating the biodiversity receptors (i.e. designated sites, habitats and species populations) that could be significantly affected by the Proposed Development.

The approach that was used for determining which receptors have the potential to be significantly affected by the Proposed Development involved using baseline data collected through the desk study (2km away for protected species and 15km for protected sites) and field surveys for the Site and to determine:

- Which, if any, of the species or habitat that have been recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat and species that have been recorded are of importance for biodiversity conservation.

The next stage of the assessment was to determine whether the identified receptors are of sufficient biodiversity value that an impact upon them would be of potential significance in terms of this ER. In this regard:

- Biodiversity conservation value relates to the quality and / or size of sites or habitats, or the size of species' populations; and,
- Potential significance means that the effect could be of sufficient concern or, for positive effects, of such substantial benefit that it could be material to influencing the decision on planning.

Receptors that have been identified as having sufficient value, and that an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further. This involved:

- Identifying, for each receptor, any significant impact that is likely to be caused by the Proposed Development, which has the potential to lead to a significant effect and / or to contravene relevant legislation;

- Determining the area within which the likely impacts would cause a potentially significant impact on the identified receptor and / or could contravene relevant legislation (ecological zone of influence); and,
- If the receptor occurs or is likely to occur within the zone of influence and concluding that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

## **6.8 Evaluation of the Conservation Importance of the Site**

In terms of biodiversity conservation value, identified receptors have been valued using the National Roads Authority (NRA) Scheme [47], using the following scale:

- International importance;
- National importance;
- County importance (or vice-county in the case of plant or insect species);
- Local importance (higher value); and,
- Local importance (lower value).

## **6.9 Study Results**

### **6.10 Desk Study**

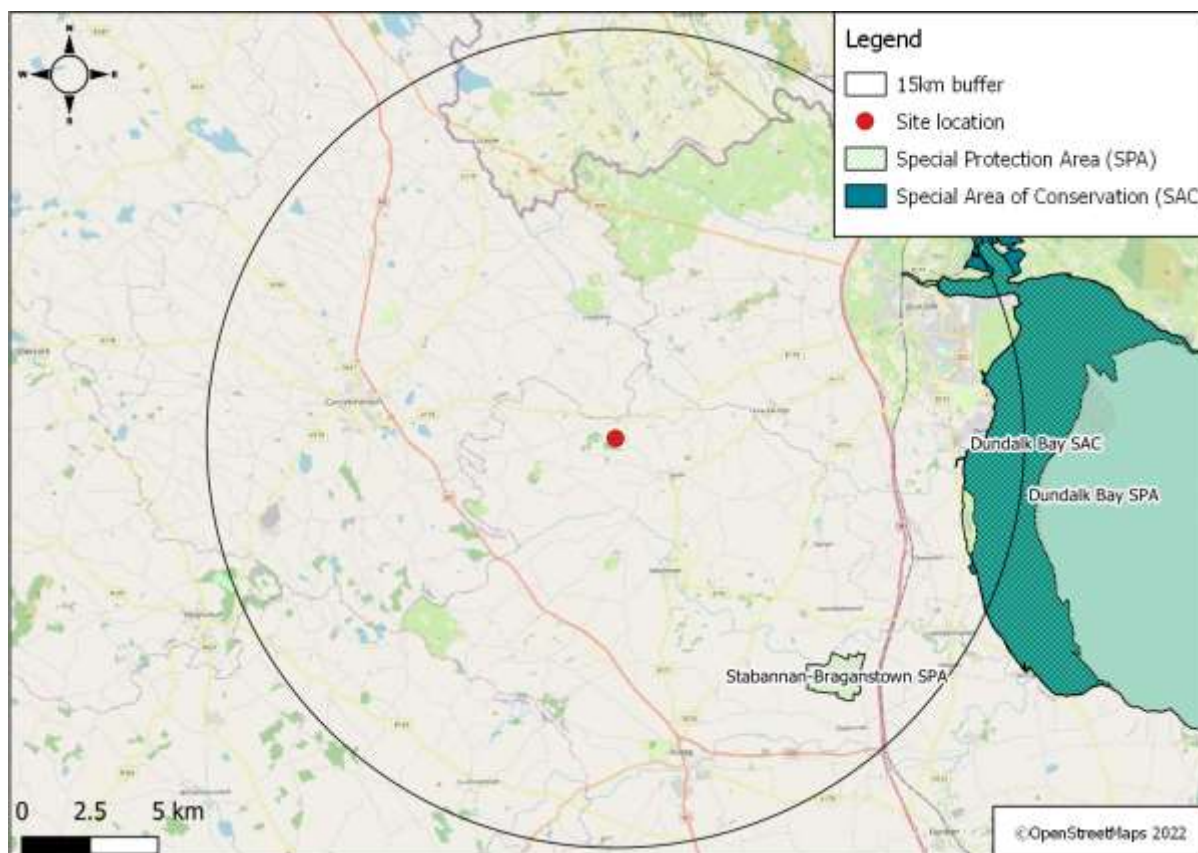
Prior to conducting any Site survey, a desk-based review of information sources was completed. This baseline information provides a valuable insight to the types of flora and fauna that may occur onsite and allows for the identification of features / habitats located offsite that may require further assessment.

### **6.11 Statutory Nature Conservation Sites**

In accordance with the European Commission Methodological Guidance [48] a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government [49] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location, and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are: the physical distance from the project to the Site; the sensitivities of the ecological receptors; and the potential for in-combination effects. All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [50], few projects have a Zone of Influence this large, however the identification of Natura 2000 sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

The boundaries of one (1No.) SAC and two (2No.) SPAs are located within 15km of the Site.

**Figure 6-1: Site Location and Natura 2000 Designated Sites within 15km**



**Table 6-1: European Designated Sites within 15km of the Site**

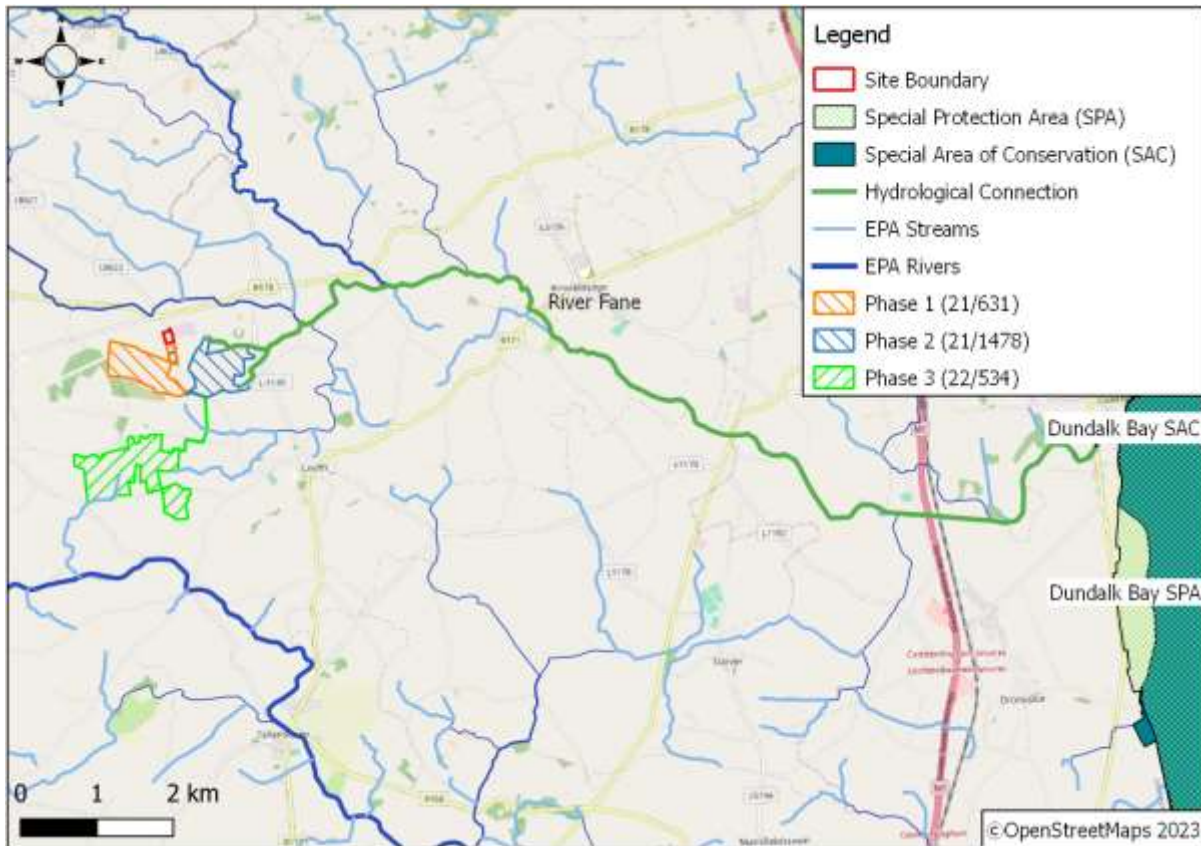
Site Name	Code	Distance (km)	Direction from the Site
<b>Special Areas of Conservation (SAC)</b>			
Dundalk Bay SAC	000455	12.4km	E
<b>Special Protection Area (SPA)</b>			
Strabannan-Braganstown SPA	004091	10.7km	SE
Dundalk Bay SPA	004026	12.4km	E

However, as outlined in Section 1.1, once all of the necessary statutory consents are in place, it is proposed that there will be one single construction project comprised of the Proposed Development and Permitted Developments.

Therefore, using the precautionary principle a precautionary assessment was undertaken of the source -pathway receptors. On this basis there is a potential hydrological connection between the Permitted Developments and the Dundalk Bay SAC and SPA via the watercourses and drainage network (see Figure 6-2). Therefore further consideration will be given to these Natura Sites, to assess potential adverse effects resulting from the Proposed Development. Further information on these Natura 2000 sites is provided below.

Please refer to the Natura Impact Statement that was submitted as part of the SID application for more details.

**Figure 6-2: Potential Hydrological Connection between the Site, Permitted Developments and Dundalk Bay SAC and SPA**

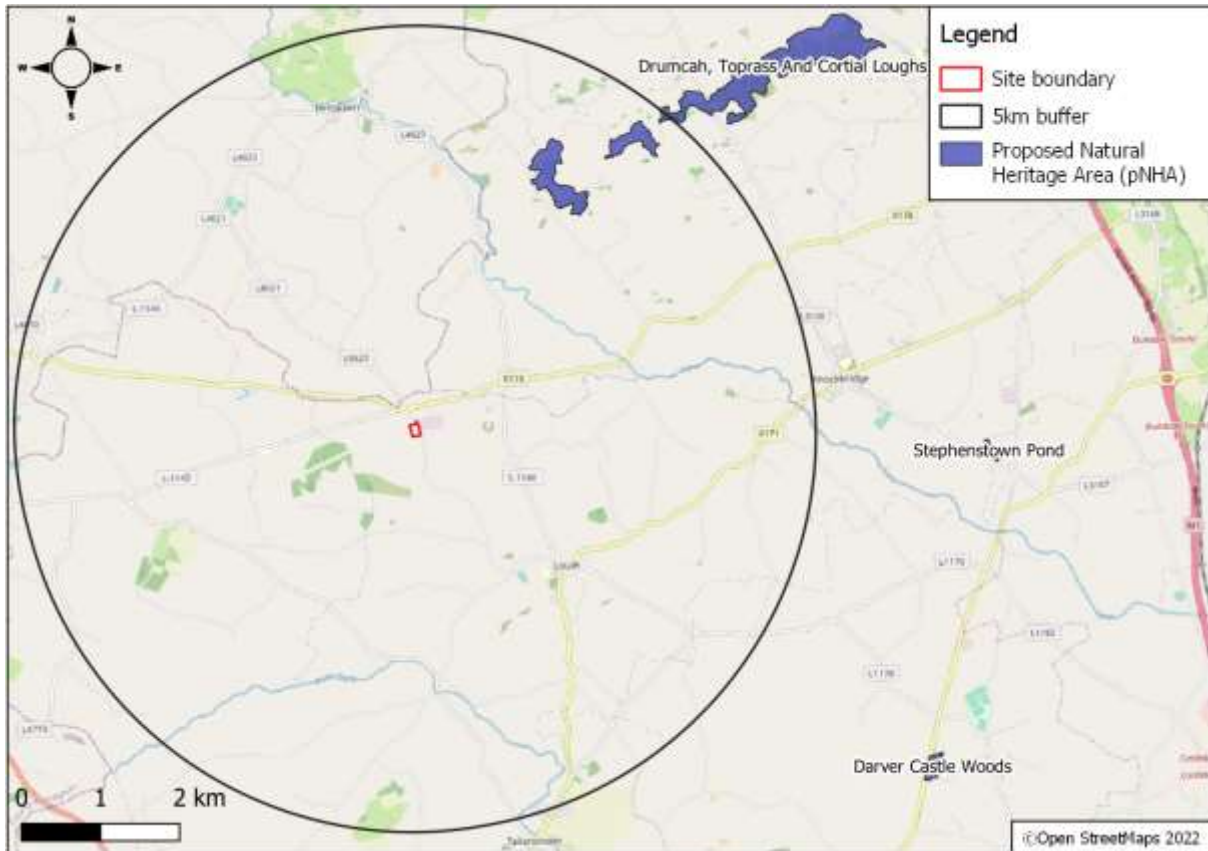


### 6.11.1 Nationally Designated Conservation Sites

All Natural Heritage Area (NHA) and proposed Natural Heritage Areas (pNHA) within a 5km radius of the Site have been considered in line with Natural Heritage Policies as outlined in the CDP [42].

There are no NHAs or pNHAs identified within or directly adjacent to the Site. There are no NHAs located within 5km of the Site. One (1No.) pNHA was identified within 5km of the Site, illustrated in Figure 6-3 and described in Table 6-2.

**Figure 6-3: Nationally Protected Sites within 5km**



**Table 6-2: Protected Sites within 5km**

Site Name	Code	Distance (km) & Direction	Qualifying Interests
<b>Proposed Natural Heritage Areas (pNHA)</b>			
Drumcah, Toprass and Cortial Loughs	001462	3.3km NE	Complex of freshwater lakes and marsh.

### 6.11.2 Protected Species

Table 6-3 provides a summary of records of legally protected or otherwise notable species that occur within a 2km grid square of the Site boundary (2km Grid Squares: H90F, H90G, H90H, H90K, H90L, H90M) in the last 10 years [51].

**Table 6-3: Protected and / or Notable Species within a 2km Grid Square of the Site**

Common Name	Scientific Name	Date of last record	Designation
<b>Mammals</b>			
Eurasian Badger	<i>Meles meles</i>	31/12/2016	Wildlife Acts 1976 / 2000
West European Hedgehog	<i>Erinaceus europaeus</i>	08/06/2012	Wildlife Acts 1976 / 2000
<b>Invasive species</b>			
Three-cornered Garlic	<i>Allium triquetrum</i>	15/06/2018	Invasive Species: Medium Impact Invasive Species

**Note:** Table includes records of protected species recorded within the last 10 years.

## 6.12 Field Survey

### 6.12.1 Habitats

The majority of the Site is comprised of agricultural grassland which is managed and used for grazing livestock. The principal natural or semi-natural habitat features noted during the Site survey were the hedgerows bordering the Site.

A description of the habitats and features of ecological significance are outlined below and illustrated in Figure 6-4.

#### Improved Agricultural Grassland (GA1)

Improved agricultural grassland is the primary habitat within the Site. At the time of the surveys, cattle were noted grazing within the Site Boundary.

The dominant species within the Site included: meadow grasses (*Poa trivialis*), Yorkshire fog (*Holcus lanatus*), nettles (*Urtica dioica*), broad leaved docks (*Rumex obtusifolius*), creeping buttercup (*Ranunculus repens*), cleavers (*Galium aparine*), common rush (*Juncus effusus*) common chickweed (*Stellaria media*), hairy bittercress (*Cardamine hirsuta*), ragwort (*Jacobaea vulgaris*), dandelion (*Taraxacum officinale*) and thistles (*Cirsium vulgare*).

Species found in the understory of the field margins of the agricultural grassland included thistles, nettles, white clover (*Trifolium repens*), dandelion, sow thistles (*Sonchus* spp.), dock, ragwort, yarrow (*Achillea millefolium*), mouse-eared chickweed (*Cerastium fontanum*), bush vetch (*Vicia sepium*), herb-Robert (*Geranium robertianum*) and pineapple weed (*Matricaria discoidea*).

#### Hedgerows (WL1)

Hedgerows were present along the perimeter of the Site and separated the Site boundary from the L5141. The main species identified within the hedgerows onsite were hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*), brambles (*Rubus fruticosus*), elder (*Sambucus nigra*), dogrose (*Rosa canina*), ash (*Fraxinus excelsior*) and Scot's elm (*Ulmus glabra*).

**Figure 6-4: Habitat Map**



## **6.12.2 Fauna**

### **6.12.2.1 Amphibians**

Amphibians require static or slow-moving water bodies in order to successfully lay their eggs and tend to favour shallow areas where they are less susceptible to being preyed on by fish.

Overall, the Site does not provide suitable habitats for native amphibian species due to the lack of streams and drainage ditches.

### **6.12.2.2 Badgers**

The NBDC holds records for badger within 2km of the Site. However, the survey did not identify any evidence of badger onsite and no active badger setts were identified in the Site.

It should be noted that signs of badger activity were identified in the wider area as part of the badger survey undertaken by MOR for the Phase 1 permitted development (PR 21/631). However, no setts were recorded as part of this survey.

The hedgerow present along the eastern perimeter of the Site could provide a suitable foraging and commuting habitat. Furthermore, the well-established hedgerows and treelines in the immediate vicinity of the Site provide connectivity to the wider landscape. In addition, the areas of agricultural grassland both onsite and within the wider area also provides further suitable foraging habitat for this species. It is therefore considered highly likely that badger utilise areas in vicinity of the Site.

### **6.12.2.3 Bats**

The Site is located within a predominately rural landscape with extensive areas of open agricultural land and hedge/ treelines both onsite and in the surrounding area. Bats are known to follow linear features as they commute through the landscape, and therefore the sections of continuous hedge / tree line along the boundaries of the Site are considered suitable for this purpose.

However, no features that are considered to be suitable to support roosting bats species were identified. These hedgerows / trees lacked features that are considered to be necessary for supporting roosting bats species, (thick ivy growth, knot holes, cracks and loose bark).

The NBDC holds no records for bat species within 2km of the Site, for the past 10 years. [45]However, it is considered likely that bats will utilise the Site and the wider area given the presence of habitats which are suitable for commuting and foraging purposes.

#### **6.12.2.4 Birds**

Given the nature of the onsite habitats, the majority of the bird species recorded onsite, or expected, are common species within the countryside. Three (3No.) bird species were recorded onsite. Of these species, two (2No.) are Green listed species, and one species is Amber listed according to the Birds of Conservation Concern in Ireland 2020-2026 report [52].

- Green listed: Jackdaw (*Carduelis carduelis*) and magpie (*Pica pica*); and,
- Amber listed: Starling (*Sturnus vulgaris*).

The areas of tree / hedge-line provide both suitable nesting sites and foraging areas for a range of common bird species. The species recorded onsite are resident species that occur year-round within habitats similar to the onsite habitats.

The agricultural grasslands onsite were not considered to be of high suitability for breeding birds, specifically ground nesting birds given the presence of cattle within the fields, which could trample nests.

#### **6.12.2.5 Invasive Species**

No invasive species were identified within the Site.

#### **6.12.2.6 Other Species**

No other protected or otherwise notable species were noted during the Site walkover.

### **6.13 Characteristics and Potential Impacts of the Site**

#### **6.13.1 Sensitive Design**

Specialist environmental input was a key element of the proposed design, to ensure that the design of the proposed infrastructure works was extremely sensitive to surrounding environmental features. This included screen planting and buffers for all ecological features. Refer to Section 5.8 of this report for further details.

#### **6.13.2 Identification of Potentially Significant Effects on Identified Receptors**

Based on the methodology that is set out in Section 6.1, Table 6-4 sets out the findings of the evaluation of important and legally protected receptors. Each receptor was assessed and a scoping justification for each receptor is provided for the Construction and Operational Phases of the Proposed Development.

**Table 6-4: Valuation of Potential Ecological Receptors**

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
<b>Protected Sites</b>				
Natura 2000 Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation.	A Natura Impact Statement (NIS) has been prepared in line with NGBs 3-6 of the LCDP [42] and submitted as part of the overall planning application. This NIS concluded that the Proposed Development would not cause any adverse effects on any European designated sites or any of their designated features of interest provided the mitigation measures incorporated within the NIS are adhered to and the progression to Stage 3 of the Appropriate Assessment process (i.e. Assessment of Alternatives Solutions) was not considered necessary.	Natura 2000 sites have been scoped out from further consideration as part of the ER
Natural Heritage Areas (NHAs)	Wildlife Act 2000 (as amended)	Nationally designated sites for conservation.	Natural Heritage Areas (NHA) were assessed in compliance with NGB 6 of the LCDP [42]. However, there are no NHAs within 5km of the Site. There is one (1No.) proposed Natural Heritage Area (pNHA) within 5km of the Proposed Development. Impacts on the pNHAs can be discounted given the lack of impact pathways and intervening road infrastructure separating these sites from the Proposed Development.	Natural Heritage Areas have been scoped out from further consideration.
<b>Habitats</b>				
Improved Grassland (GA1)	N/A	Low Local Value	This is a common habitat type throughout Ireland and provides limited ecological value. This habitat is not of significant conservation value, and no notable or protected species were identified within this habitat during surveys.	This habitat has been screened out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Hedgerows (WL2)	Wildlife Act 2000 (as amended)	High Local Value	<p>As part of the Proposed Development the hedgerow onsite will be retained and protected throughout the lifetime of the Proposed Development. As part of the Phase 1 permitted development (21/631), it will be necessary to cut / trim back sections of hedgerow, ca. 143m, (ca. 66m trimmed back to the north, with ca. 76.5m trimmed back to the south) to facilitate a safe site entrance. These trimmed back remaining hedgerow sections will then be reinforced with strengthening planting, this is in-line with policy as per policies NGB 31, NGB 33 and NGB 34 of the LCDP [42].</p> <p>Taking into account the measures that will be implemented for trees and hedgerows and that all works will be set back a minimum of ca.6m, there will be no impacts to this habitat as part of the Proposed Development.</p>	This habitat has been screened out from further consideration.
<b>Flora and Fauna</b>				
Flora	N/A	N/A	<p>No plant species protected under the Flora Protection Order were noted onsite. The NBDC holds records for one medium impact invasive plant species within 2km of the Site [45], but this was not identified during Site surveys. Overall, the impact of the Proposed Development on flora is considered unlikely to be significant.</p>	This receptor has been scoped out from further consideration.
Amphibians	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	Low Local Value	No signs of amphibians were noted during the field surveys. It is not considered the onsite habitats are suitable for amphibians due to the absences of any static drainage ditches or waterbodies onsite.	This receptor has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
Badgers	Wildlife Act 2000 (as amended)	Low Local Value	<p>The NBDC holds records for badger within 2km of the Site in the past 10 years [45], however, no signs of badger activity were noted during the habitat survey (i.e. badger footprints, badger scat and badger setts). There is however potential for badgers to utilise the Site due to the presence of commuting habitats and connectivity to the surrounding landscape. Linear features used for commuting and foraging will be retained, and therefore it is considered unlikely that any impacts on badger will occur.</p> <p>As part of the Proposed Development, palisade fencing will be erected which will stop any Badgers from entering the Site.</p> <p>Taking into account the potential for badgers to utilise the Site, given the presence suitable commuting habitat onsite and within the wider area, and the potential for this species to become entrapped in trenches / excavations, appropriate measures to prevent or minimise impacts on badger are required. Refer to Section 6.7.5.</p>	This receptor has been scoped in
Bats	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	High Local Value	<p>The NBDC holds no record of bats within 2km of the Site in the past 10 years [45]. Furthermore, no trees suitable for roosting bats were identified within the Site. The majority of the Site is also considered to be of limited value for this species and it is considered that no species utilising these areas will be negatively impacted by the Proposed Development.</p> <p>Additionally, as stated in section 5.3 'Sensitive Design' of the ER, a 6m buffer between all works and existing hedge / treelines will be implemented which will maintain the integrity of these hedge / treelines and biodiversity functions.</p> <p>Given the nature of the habitats to be impacted by the works, it is considered unlikely that any impacts on bats will occur as a result of the Proposed Development.</p>	This receptor has been scoped out from further consideration.
Birds	Wildlife Act 2000 (as amended) EU Habitats Directive Annex I	Low Local Value	<p><u>Breeding and Nesting Birds</u></p> <p>It is not considered that the Proposed Development will have a significant impact on birds given that all treelines and hedgelines, which offer good foraging potential and nesting potential, will be retained and protected.</p>	This receptor has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification	Scoping Result
			<p>Overall, it is not considered that the Proposed Development will have a significant impact on breeding birds.</p> <p><u>Disturbance</u></p> <p>Birds are highly mobile and will move away from disturbances. It is anticipated that disturbance onsite will be relatively localised. During the construction phase of the Proposed Development, should any birds be disrupted during any of the works it is considered that these birds will move to a suitable area elsewhere given the abundance of similar and suitable habitat within the vicinity of the Site. Furthermore, any potential disturbances will only occur during the construction phase.</p> <p>Following the completion of the proposed works, the Site will only require 2-3 maintenance visits with small vans / jeeps, therefore, there will be a reduction in vehicular / machinery disturbance in comparison to the current maintenance regime given the fact that tractors and harvesters will not be used onsite. Overall, it is considered that the Proposed Development will not result on any significant disturbance impacts to bird species utilising the Site.</p>	
Other fauna	N/A	N/A	It is considered that the Proposed Development will not give rise to any significant impacts to other fauna, given that the key habitat features will be retained and safe guarded as part of the development at the Site.	This receptor has been scoped out from further consideration.
Invasive Species	N/A	N/A	<p>No invasive species were noted within the study area. Therefore, this receptor has been screened out.</p> <p>Standard biosecurity measures will be implemented onsite during the construction phase in order to mitigate against the unintentional introduction of invasive, see Section 6.1.5.</p>	This receptor has been scoped out from further consideration.

## 6.14 Characteristics and Potential Impacts of the Site

General mitigation / best practice measures have been included for the Proposed Development. Also, specific mitigation measures will be implemented for retained trees and hedgerows, terrestrial mammals, birds and invasive species.

It is considered that the operational phase of the Proposed Development is unlikely to have significant ecological impacts.

## 6.15 Mitigation Measures

### 6.15.1 Construction Phase

Disturbance to fauna during the construction stage may potentially arise as a result of a short-term increase in human presence onsite and additional construction noise and lighting within the Site. However, all construction works will be temporary and short-term in nature, estimated to last approximately 14 months for the Overall Development. The works will not involve any major site clearance or earthworks. Nonetheless, during the construction phase all works will comply with all relevant legislation and best practice to reduce any potential environmental impacts.

A pCEMP will be prepared by the appointed main contractor and will be submitted to the planning authority in advance of works commencing as detailed in Section 5.9.

The following general mitigation measures will be incorporated and adhered to during the Proposed Development to ensure that the works do not result in contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this ER will be fully adhered to;
- The Site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the ER;
- An ecological clerk of works (ECoW) will be appointed for the duration of the project;
- If protected or notable species are encountered during operations at the Site, the ECoW will be contacted for advice;
- Protected and notable species posters will be erected on the Site notice board and maintained throughout the duration of the works; and,
- In advance of works, all Site personnel will receive a toolbox talk regarding notable and protected species. Everybody working onsite must understand the role and authority of the ECoW.

An ecological clerk of works will inspect the Site in advance of works commencing and will undertake site inspections as required during the works, to ensure that all of the works will be completed in line with the final CEMP and all relevant wildlife legislation.

#### 6.15.1.1 Protection of Retained Trees and Hedgerows

In-line with policy NGB 31, NGB 33 and NGB 34 of the LCDP [42], care will be required to protect the sections of hedgerows and treelines onsite from both direct and indirect disturbance during construction. The infrastructure will be set back a minimum of approximately 6m from the existing boundary features and it is therefore considered highly unlikely that any impacts will occur. Furthermore, care will be required to prevent disturbance to root systems. The standard measure to achieve this is that every effort will be made to minimise works within the outer canopy limit of the trees:

- Trees and hedgerows close to construction areas will be fenced off to prevent accidental disturbance from construction vehicles;

- Care will be required to prevent disturbance to root systems – a buffer zone of 6m of unexcavated ground will be maintained along the retained hedgerows, treelines and woodland;
- During any works close to the buffer zone, should the operators encounter any root smaller than 35mm diameter they should be pruned carefully with an appropriate cutting tool such as a saw or secateur, and roots larger than this will require consultation with an arboriculture specialist;
- The sections of hedgerow, treelines and woodland to be retained will be fenced;
- No materials or equipment will be stored within the buffer zone; and,
- In order for hedge protection measures to work effectively, all personnel associated with the operation of machinery must be familiar with the above principles for the protection of hedgerows / treelines.

#### **6.15.1.2 Measures for Non-volant Mammals**

Given the presence of onsite habitats with features that have the potential to support sheltering, foraging and commuting mammals (including badger), and in order to ensure that the works in relation to the Proposed Development will not have significant impacts on mammals, general construction procedures and mitigation measures, which are in line with the TII guidance for Badgers [33], will be undertaken.

- A pre-construction survey will be carried out to confirm absence of terrestrial mammals within or close to the works areas;
- Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed;
- Should construction works be required outside of daylight hours during the Site clearance works, the appointed project ECoW will be consulted as required; and,
- If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.

#### **6.15.1.3 Measures for Breeding Birds**

In order to ensure no impacts occur to birds as a result of the Proposed Development and in the event that works need to be undertaken within the main breeding season, should birds nest within the active working area be identified during the construction phase, works within the area will stop within the area and the project ECoW will be consulted.

It is considered unlikely that birds will be significantly impacted as a result of the Proposed Development. However, it should be noted that birds may be subject to some temporary minor disturbances during construction. Due to the fact that birds are a highly mobile species, should any birds be impacted, these birds will move away from the disturbance to a more suitable area, therefore, this is not considered likely to be significant

#### **6.15.1.4 Measures for Invasive Species**

To mitigate against the unintentional introduction of invasive species during construction and decommissioning works, the following mitigation measures will be followed:

- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;

- All materials to be imported to the Site including additional planting will be sourced from a reputable supplier and records of all material and supplies will be maintained;
- In advance of works, all Site personnel will receive a toolbox talk with regards to invasive species; and,
- Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species.

### **6.15.2 Operational Phase**

It is not anticipated that any operational phase of the Proposed Development will result in any impacts to flora or fauna onsite or within the vicinity of the Site and as such no operational phase mitigation measures will be required.

### **6.16 Cumulative Impact Assessment**

The Proposed Development will supersede the two granted 37 kV substations under PR 21/631. The Proposed Development will serve one overall solar PV farm, battery storage facility, one onsite substation and associated underground grid connection all of which has already been permitted by Louth County Council. The overall site area of all three Permitted Developments will be ca. 138.3ha with a total number of approximately 261,600 individual solar panels, 102no battery storage containers and one onsite substation.

As the overall solar and battery storage development will be constructed and will operate in tandem, there is potential impacts to occur without the appropriate mitigation measures in place. All best practice guidance and mitigation measures included within this ER and NIS for the Proposed Development, have also been put in place for the Permitted Developments. Therefore, all impacts associated with the Overall Development will be mitigated appropriately and no cumulative impacts will likely occur to local flora and fauna.

Biodiversity Management plans (BMPs) have been prepared for each of the Permitted Developments. Under these management plans the following will be implemented as part of the Overall Development:

- Ca.7.48ha of wet grassland and scrub habitat has been set aside from development for biodiversity enhancement and wildlife use;
- The creation of five (5no.) scrapes within the 7.48ha wet grassland area. Scrapes are shallow depressions with gently sloping edges, which seasonally hold water. They create obvious in-field wet features that enhance the habitat for invertebrates, amphibians and encourage nesting of waterfowl birds;
- The creation and maintenance of a species-rich grassland with a varied sward structure under the solar panels;
- The creation and maintenance of a species rich wildflower meadow mixed specifically to benefit common farmland birds;
- Enhancement of existing planted areas with additional hedgerow species-rich planting along the site boundaries. As part of the Overall Development there will be ca. 21.9km of hedgerow bolstering plantings;
- The provision of wildlife shelters providing nesting opportunities for protected and locally important species including bird boxes, barn owl nest box, bat boxes and habitat piles; and,
- Provision of mammal gates to maintain connectivity for mammals such as badger moving through the landscape.

## 6.17 Conclusions

Based on the findings of a detailed desk-based study, a review of all the ecological information available for the Site and wider area and field surveys by MOR Ecologists, it is considered reasonable to conclude the following:

- The overall Site itself, comprising mainly of agricultural grassland, is considered of low ecological value;
- The Site is located in an area predominantly made up of agricultural fields. It is not of value to any Annex I or Annex II species or Red listed birds; and,
- The Proposed Development will not result in any significant impacts on ecological receptors identified both onsite and in the surrounding area following the implementation of appropriate mitigation measures / enhancement measures.

Taking into account the nature of the Proposed Development and all of the enhancement measures to be implemented as part of the Overall Development, it is considered that the Proposed Development is consistent with the National, Local and Municipal planning policies and objectives, will support the protection and enhancement of the environmental quality of the area. It is considered that the Overall Development will have a positive impact on local biodiversity.

## 7 WATER

The main objective of this chapter was to assess whether there are any likely hydrological / hydrogeological impacts to water, including flood risks, during all phases of the Proposed Development.

The Permitted Developments (PR 21/631, 21/1478 and 22/534) submitted site specific Flood Risk Assessments (PFRAs) which were accepted by Louth County Council (LCC). The field results from these (particularly that of PR 21/631 in which the Proposed Development is contained) informed this chapter.

### 7.1 Site-Specific Preliminary Flood Risk Assessment (PFRA)

The following relevant best practice guidance was followed in the assessment:

- *“The Planning System and Flood Risk Management – Guidelines for Planning Authorities”* [53].

This guidance sets out a risk based sequential approach to flood risk assessment. Three key stages are identified as follows:

- **Stage 1 - Flood Risk Identification** - To identify whether there may be any flooding or surface water management issues related to a plan area or Proposed Development site that may warrant further investigation;
- **Stage 2 - Initial Flood Risk Assessment** - To confirm sources of flooding that may affect a plan area or a Proposed Development site to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed. Where existing river or coastal models exist, these should be broadly used to assess the extent of the risk of flooding, and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures;
- **Stage 3 - Detailed Flood Risk Assessment** - To assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed area or existing development, its potential impact on flood risk elsewhere and the effectiveness of any proposed mitigation measures. This will typically involve construction of a new, or use of an existing, hydraulic model of the river or coastal cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved. The need to progress to Stage 3 is carefully considered following completion of Stage 1 and Stage 2.

### 7.2 Methodology

This PFRA has been carried out in accordance with the aforementioned relevant best practice guidance [53] and comprised the completion of the following key stages, using the phased approach:

- Stage 1 - Flood Risk Identification; and,
- Stage 2 - Initial Flood Risk Assessment.

Specifically, the agreed scope of works undertaken as part of the assessment comprised the elements detailed below.

#### 7.2.1 Initial Desk-based Study

This task involved undertaking a detailed review of all available desk-based information in relation to historic flooding and potential future flood risk including the following published information:

- Ordnance Survey Ireland (OSI) Online mapping [54];
- Geological Survey of Ireland (GSI) Online mapping [55];
- The Office of Public Works (OPW) website and Online mapping [56];
- Environmental Protection Agency (EPA) Online mapping [57];
- Louth County Development Plan 2021-2027 [42];
- Flood Risk Management Plan for the Neagh Bann River Basin (UOM06) [58]; and,
- Department of Environment, Community and Local Government Online mapping [59].

A topographical survey was also conducted and reviewed as part of the desk-based assessment work.

### **7.2.2 Site Walkover Surveys**

A Site walkover survey was completed on 2<sup>nd</sup> of March 2021 and on 29<sup>th</sup> of September 2022 by MOR Consultants. Visual assessments of ground conditions at the Site were undertaken and documented.

#### **7.2.1 Data Assessment and Reporting**

All available information from the Site visits and desk-based studies has been evaluated and the findings are presented in this chapter.

#### **7.2.2 Soil Sampling**

An experienced MOR geologist who is a professional member of the Institute of Geologists of Ireland designed an intrusive site investigation to further characterise the soils in the immediate vicinity of the Site.

An intrusive site investigation to further characterise these soils took place on the 20<sup>th</sup> of July 2021 as part PR 21/631. Five (5 No) trial pits were subsequently excavated within the site boundary of Phase 1 permitted development (PR 21/631) (see Figure 7-1).

**Figure 7-1: Soil Sampling Locations Phase 1 PR 21/631**



**Figure 7-2: Trial pit 1 (TP1) is located in close proximity to the Site boundary.**



The excavation of the trial pits was undertaken to a maximum depth of 2.0mbgl (metres below ground level) using a JCB excavator. Each trial pit was logged in accordance with the BS 5930:2015+A1:2020 standards.

The excavated soil from each trial pit was visually analysed and described onsite by the MOR geologist present during the excavation works. A photographic record of each trial pit was also maintained. The location of the trial pits was selected based on the findings of the desk study, review of engineering drawings and previous site walkovers. Each trial pit was reinstated to as close to its original condition as possible prior to mobilising to another location.

### **7.3 Stage 1 – Flood Risk Identification**

#### **7.3.1 Topography**

The topography of the Site ranges from 33 metres above Ordnance Datum (mAOD) in the north to 36 mAOD in the south.

#### **7.3.2 Soils**

According to the GSI, the soils beneath the majority of the Site comprise AminDW, which is deep well drained soil derived from mainly non-calcareous parent materials [55].

##### **7.3.2.1 Subsoils and Hydrogeology**

According to the GSI, the subsoils beneath the majority of the Site comprise sandstone and shale till (Lower Palaeozoic) (TLPSsS) and a small area of cut over raised bog is located in the northern most sections of the Site [55]. Refer to Figure 7-3 below.

Based on the field observations during the trial pit excavation for PR 21/631, the soils present at the Site comprises a layer of topsoil overlaying the subsoils, the depth of this ranges between 0.25mbgl (metres below ground) at TP1 and 0.5mbgl at TP5. The topsoil generally comprises brown to black clay with roots. The subsoils underlying the topsoil at the Site are mainly described as very sandy, very gravelly, clay with cobbles. All of the excavated subsoils were dry except at TP5, where there was an ingress of water into the pit at approximately 1.8mbgl. TP5 is ca. 730m from the Proposed Development at its closest point.

The soils present at the Site are generally classified as brown earths, which are characterised by being well-drained soils mainly derived from non-calcareous parent materials.

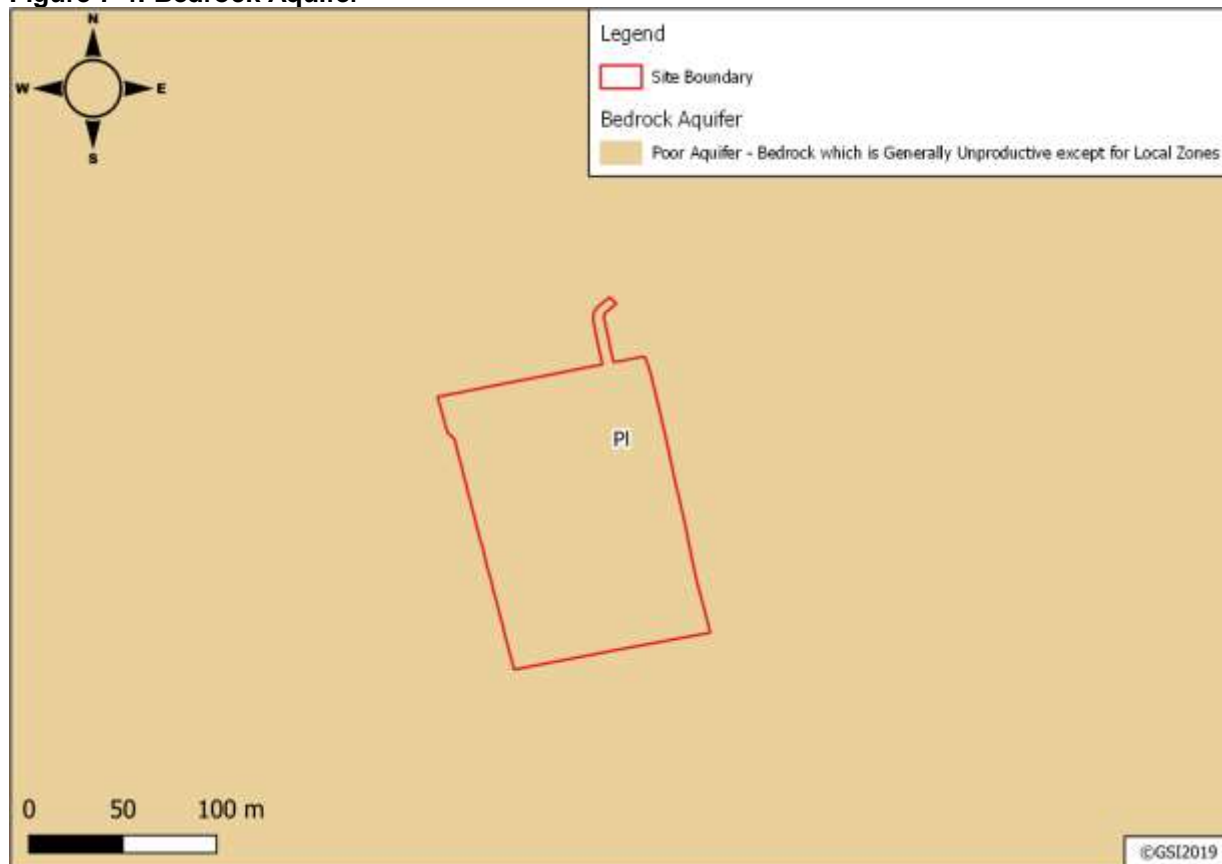
Figure 7-3: Subsoils



According to the GSI, the bedrock aquifer beneath the Site comprises the Clontail Formation (calcareous red-mica greywacke) and is classified as a poor aquifer - bedrock which is generally unproductive except for local zones [55]. Refer to Figure 7-4.

There are no reported karst features within 5km of the Site [55].

**Figure 7-4: Bedrock Aquifer**



### 7.3.3 Hydrology

There are four (4No.) hydrological features of note in the vicinity of the Site. Refer to Section 1.4 of this ER for details.

#### 7.3.3.1 Drainage

As discussed in Section 5.5, the Proposed Development will be surfaced with a layer of hardcore. This free draining material will allow rainfall to permeate into the ground. As only small areas will comprise of hardstanding, it is not considered that any alteration to the existing drainage at the Site will be required.

A SuDS approach is proposed for the surface water drainage. Rainfall runoff from the Control building roof in the substation will be collected and piped to a rainwater harvesting tank for reuse in the onsite toilets. As water use for flushing toilets will be very low due to the infrequent use of the building, the majority of the rainwater from the roof will drain into a proposed soak away. As there is no requirement for grey water in the IPP buildings the runoff from the roof will be collected and piped directly to the soak away pit.

### 7.3.4 OPW National Flood Hazard Mapping

The OPW national flood hazard mapping was consulted [56]. A single historic flood event was noted immediately to the east of the Site on the L5141 local road (Figure 7-5). This single flood event was noted as having occurred during February 2013 and was attributed to runoff from adjacent lands [56].

**Figure 7-5: Historic Flood Event Immediately to the East of the Site**



### **7.3.5 Available Detailed Flood Risk Assessments**

The Site is located within the OPW Neagh Bann River Basin [60].

Finalised flood risk assessment maps were published by the OPW as part of the Catchment Flood Risk Assessment and Management (CFRAM) programme and were launched via the 'Flood Info' website in May 2018. Under this programme, Flood Risk Management Plan for the Neagh Bann River Basin (UOM06) was compiled [58].

## **7.4 Stage 2 – Initial Flood Risk Assessment**

### **7.4.1 Appraisal of the Availability and Adequacy of Existing Information**

Based on the findings of the desk-based assessment and the site walkover survey, and taking account of additional available information, it is considered that there is sufficient technical information to complete this PFRA.

### **7.4.2 Evaluation of Potential Sources of Flooding**

The following types of potential flooding sources have been considered, which could affect the Proposed Development:

- Rivers / streams / surface watercourses;
- Groundwater systems and infiltration capacity of the soils; and,
- Pluvial flood risk posed by heavy rainfall and associated surface water ponding.

Accordingly, each of these potential sources of flooding warrant further consideration as part of this assessment.

#### **7.4.2.1 Rivers / Streams / Surface Watercourses**

Based on the current available OPW information [56], there is no identified potential risk of fluvial flooding on the Site or within close vicinity of the Site.

#### **7.4.2.2 Groundwater Systems and Infiltration Capacity of the Soils**

Overall, it is unlikely that the bedrock aquifer (groundwater) will pose a risk for flooding during high rainfall events. This assumption is based on the fact that the bedrock aquifer underlying the Site has been classified as a poor aquifer, where the bedrock is generally unproductive except for local zones, and, according to the GSI, a sand and gravel aquifer is not present beneath or in the vicinity of the Site. In addition, the subsoils present at the Site are characterised by moderate permeability overlain by well drained soils.

Furthermore, during the trial pit investigation undertaken in July 2021 as part of Phase 1 permitted development (PR 21/631), the excavated soils to a maximum depth of 2mbgl were dry. There was no ingress of water in Trial Pits 1, 2, 3 and 4. Trial Pit 5, which is located in a low-lying area and is ca. 730m from the Site boundary had an ingress of water. This water at TP5 was considered to be localised perched water rather than the local groundwater table, hence it will not pose a risk of flooding in the area.

Therefore, the potential flood risk posed by the infiltration capacity of the soils and the bedrock aquifer is considered to be negligible and will not be considered further.

#### **7.4.2.3 Pluvial flood Risk Posed by Heavy Rainfall and Associated Surface Water Ponding**

Based on the available OPW flood hazard mapping information, there is no known potential risk of pluvial flooding (i.e. flooding that results from rainfall-generated overland flowing before the water enters a watercourse) on the Site [56]. A single historic flood event associated with runoff occurred directly to the east of the Site as discussed in Section 7.3.4.

Therefore, based on the nature of the Proposed Development and the historic pluvial flood event, the risk of flooding associated with pluvial flooding warrants further consideration.

### **7.5 Review of Available Detailed Flood Risk Mapping – Key Findings**

#### **7.5.1 Potential Pluvial Flooding Risk due to the Proposed Development**

Based on the current available OPW information [56], there is no identified potential risk of pluvial flooding within the Site. In regard to pluvial flooding, there is no history of pluvial flooding within the Site boundary and there was no indication of pluvial flooding event during the site walkover undertaken in March 2021 for PR 21/631 and 28<sup>th</sup> September 2022.

However, given the historic flood event located to the east of the Site, the design measures have been implemented in order to ensure the Proposed Development does not pose a pluvial flood risk.

The proposed substations shall be surfaced with a layer of permeable stone hardcore. This free draining material will allow rainfall to infiltrate into the ground. A SuDS approach is proposed for the surface water drainage. Rainfall runoff from the I.P.P. building and EirGrid Control building roofs in the substations will be collected and piped to a rainwater harvesting tank for reuse. Additionally, the access under the Phase 1 permitted development (21/631) will be utilised for construction and operational phases of the Proposed Development. The surfacing of the access track will be comprised of a layer of permeable stone hardcore, which will allow for surface water to percolate into the ground.

The findings of the trial pits in this area indicated that the soils are well-drained and therefore, the risk of potential pluvial flooding will be negligible given the infiltration capacity of the soils and the measures adopted for the Proposed Development within the substations area (i.e. permeable hardcore).

Overall it can be concluded:

- The Proposed Development will not impede on infiltration or runoff;
- The Proposed Development will not displace any potential flood waters;
- Cables and cable ducting shall be designed and installed to prevent ingress of water and these will be underground; and,
- The substations building shall not be located in an area of flood risk.

### **7.5.2 Justification Test Criteria**

According to best practice guidance [53] flood zones are geographical areas within which the likelihood of flooding is in a particular range, and they are a key tool in flood risk management within the planning process. There are three types / levels of flood zones defined for the purposes of these guidelines, as presented below:

- Flood Zone A: where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B: where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and,
- Flood Zone C: where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

Based on available predictive flood mapping [56], the entire Site can be categorised as Flood Zone C. Furthermore, there is no historic evidence of any fluvial flooding in the immediate vicinity of the Site. Given the size of the Louth Stream Tributary, the risk of flooding associated with fluvial flooding does not warrant further consideration. It should be noted that the Proposed Development falls in the vulnerability class of 'Highly Vulnerable Development' (see Figure 7-6). However, as the Site is located within Flood Zone C, The Proposed Development is still considered to be 'Appropriate', and therefore a justification test is not required (Refer to Figure 7-7).

**Figure 7-6: Classification of Vulnerability of Different Types of Development (Extract from DEHLG Guidelines, 2009)**

Vulnerability class	Land uses and types of development which include*:
<p><b>Highly vulnerable development (including essential infrastructure)</b></p>	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children’s homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.</p>
<p><b>Less vulnerable development</b></p>	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
<p><b>Water-compatible development</b></p>	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>

\*Uses not listed here should be considered on their own merits

**Figure 7-7: Justification Test Criteria (Extract from DEHLG Guidelines, 2009)**

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

## 7.6 Proposed Mitigation Measures

Given that no potential flood risks have been identified associated with the Proposed Development, no adverse impacts in regard to flooding on the Site are anticipated.

A Site-specific pCEMP has been prepared as part of this planning application and a final CEMP will be prepared by the Contractor will be implemented to ensure that construction works will have no significant impacts as outlined in Section 5.9.

## 7.7 Cumulative Impact

Extensive survey work was undertaken as part of the Permitted Developments on soil and flooding. The conclusions of these reports were that the developments will not exacerbate flooding in the immediate vicinity or the wider area. Therefore, there is no anticipated cumulative impacts associated with the Proposed Development and developments in the vicinity of the Site on Flooding.

## 7.8 Assessment Conclusions

- A PFRA has been completed for the Proposed Development, in accordance with the planning system and Flood Risk Management Guidelines [53];
- As there will be no net increase in the discharge rate or runoff volume from the Site, the Proposed Development will not have any impact on any potential offsite flooding events;
- The Proposed Development will not require any alternations to the existing drainage network; and,
- The development of substations and its associated infrastructure at the Site will not result in any adverse impact to the hydrological regime of the receiving environment as there will be no identified impact on the Site or any offsite receptors. Therefore, it is considered that the Proposed Development is an appropriate development for this Site from a flood risk perspective.

## 8 NOISE

This chapter details a noise impact assessment prepared to assess the likely noise arising during the construction and operational phases of the Proposed Development over its lifetime. The assessment will also consider the potential cumulative impacts associated with the Proposed Development and the Permitted Developments that have already obtained planning consent.

### 8.1 Scope

The aim of this chapter was to:

- Characterise the existing ambient acoustic environment;
- Identify local Noise Sensitive Receptors (NSRs) to the Site;
- Assess the likely noise emissions arising during construction;
- Assess the likely noise emissions from identified noise sources during operation of the Proposed Development;
- Assess potential cumulative impacts from the Proposed Development and the Permitted Developments (PR 21/1478, 21/631 and 22/534);
- Identify any relevant mitigation measures, where appropriate; and,

A glossary of terms of the main parameters utilised are detailed below:

- $L_{Aeq,T}$  is the equivalent continuous sound level, used to describe the fluctuating noise in terms of a single noise level over the same sampling time period (T); and,
- $L_{A90,T}$  is the A-Weighted noise level in the lower 90 percentile of the sampling interval 'T', excludes intermittent features typical of traffic and typically utilised to describe background noise.

A full glossary of terms is given in Appendix C-1.

### 8.2 Methodology

The following documentation was reviewed and utilised in the preparation of this assessment:

- BS5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites, Noise [61];
- S.I. No. 549/2018 European Communities (Environmental Noise) Regulations 2018 [62];
- IOA & IEMA Guidelines for Environmental Noise Impact Assessment, 2014 [63];
- ANC Guidelines (Greenbook) Environmental noise measurement guide 2013 [64];
- ISO 1996-1:2016 Acoustics - Description, measurements and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003 [65];
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels [66];
- ISO 9613-1:1993 Acoustics — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere [67];
- ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation [68];
- EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) [69];

- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 [70];
- NRA Good practice guidance for the treatment of noise during the planning of National Road schemes, March 2014 [71];
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 [72];
- World Health Organization's (WHO) Night noise guidelines for Europe [73];
- WHO Environmental Noise Guidelines for the European Region 2018 [74];
- WHO Guidelines for Community Noise [75];
- Louth County Development Plan 2021-2027 [42]; and,
- Louth County Council Noise Action Plan 2018-2023 [76].

This chapter took the following approach to assess potential impacts arising from the Proposed Development based on the best practice guidelines outlined above:

- Characterisation of the existing acoustic environment;
- Identification of NSRs through desk-based studies and a Site visit;
- Characterisation of the Permitted Developments and Proposed Development and the identification of likely noise emissions through a review of our in-house acoustic library and previous experience;
- Identification of the propagation of noise between the Permitted Development and Proposed Development and NSRs utilising standard propagation equations as per ISO standards;
- Calculation of the likely impact on the acoustic environment through reference to best practice guidance and standards; and,
- Assessment of the significance of the likely impact from the Proposed Development.

### **8.2.1 Competency**

The detailed desk-based assessment and the design of monitoring programme was undertaken by a principal MOR acoustician, who is a full member of the Institute of Acoustics (MIOA) and Association of Acoustic Consultants of Ireland (AACI) with over 15+ years' experience.

The noise assessment has therefore been completed by a 'competent person'.

### **8.2.2 Desk Based Assessment**

The assessment incorporated the following elements:

- Review of all drawings prepared for the planning application;
- Review of the Construction Traffic Management Plan prepared by MOR, which is outlined in Chapter 11 (Traffic);
- Characterisation of the local noise environment utilising published and publicly available information including the Louth Noise Action Plan 2018-2023 [76]; and,
- Review of best practice UK guidance for solar farm noise impact assessments in the current absence of an Irish or recognised international project specific standards or guidance documents.

The County Development Plan 2021-2027 has the following statements in relation to noise from new developments:

*13.13.9 (Employment) Noise, Lighting and Emissions - As part of the design and layout of any development, consideration must be given to the impact of the development on surrounding properties and residents in relation to air quality, excessive noise, and lighting. External lighting shall be designed to have minimal spillage or pollution into the surrounding environment or residential areas. Developments shall be designed to minimise noise levels. Where it is considered that a development is likely to generate excessive noise, a condition may be attached to a planning permission relating to the level of noise generation.*

*13.13.11.4 (Employment) Residential Amenity - The design and scale of any development shall take account of the potential impact on the amenities of surrounding properties with regard to noise, lighting, air quality, and general disturbance.*

### **8.2.3 Baseline Noise Monitoring**

A detailed noise survey was completed by MOR acousticians over three separate dates on the 21<sup>st</sup>, 22<sup>nd</sup> and 26<sup>th</sup> October 2021 in accordance with ISO 1996-2:2017. The survey was completed during daytime (8am to 10pm) and night-time (10pm to 8am) hours. This survey is deemed to represent the acoustic characteristic of the locality and the receptors local to the Site.

Due to the nature of the Proposed Development, the following distinct operational noise source will be present on the Site:

- Substation (2 Power Transformers and 4 House Transformers),

The substation will operate 24-hours a day.

Sound measurements were carried out utilising:

- Bruel and Kjaer 2250 Sound Level Meter (SLM) Type 1. This SLM was equipped with Frequency Analysis software (BZ7223) and Logging software (BZ7224);
- Cirrus Optimus Green Sound Level Meter (SLM) Type 1. This SLM was equipped with Frequency Analysis software and Logging software.

The SLMs were calibrated prior to and following the measurement period using:

- Bruel and Kjaer sound level calibrator Type 4231.

The SLM was laboratory calibrated within the previous 24 months and the field calibrator was laboratory calibrated within the previous 12 months as recommended by the manufacturer. Calibration certificates for the SLM and field calibrator are available on request.

The SLMs were set to measure sound in the A-weighted network and with a fast (F) sampling interval, unless otherwise stated, for broadband parameters. A weighted fast sampling is utilised to better replicate human hearing response to sound. Tonality (1/3 octave frequencies) was measured unweighted, defined as 'Z-weighting' to enable an assessment for tonality.

Wind speed was measured during the survey using a portable anemometer, a Kestral 2500.

Calibration certs are available upon request.

### **8.2.4 Noise Modelling**

Noise modelling was carried out using SoftNoise Predictor version 2022.1 software. The Predictor-LimA Software Suite is the complete solution for all environmental noise projects. Noise predictions for industry, roads, railways, aircraft and wind turbines are all supported. The software is used by acoustic consultants, environmental authorities, heavy industries and educational institutes.

The noise model has been developed for the Proposed Development and Permitted Developments to incorporate the new noise emission sources and the topography of the local environment.

The future noise model only assesses site-specific emissions – i.e., it does not incorporate existing ambient sources such as road traffic. Source sound values were populated utilising the in-house MOR source library consisting of measured sources from similar facilities and the SourceDB provided with the Predictor software package.

The plant and equipment at the future facility are:

- Fixed plant emissions.

Fixed plant emissions incorporate the substations.

The model was run utilising ISO 9613 1 & 2 for the basis of sound transmission from source to receiver.

### 8.2.4.1 Model Calculations

The Noise Model calculation formula is based on ISO 9613 – 1 & 2. Utilising this standard Predictor calculates the noise level as follows:

$$L|t.per = L_{dw} - C_{m,per} - C_{t,per}$$

Where

$$L_{dw} = L_W + D_c - A$$

$L_{t,per}$	Long-term average octave (or 1/3-octave) SPL during the evaluation period in dB
$L_{dw}$	Equivalent continuous downwind octave (or 1/3-octave) SPL in dB
$C_{m,per}$	Meteorological correction during the evaluation period in dB
$C_{t,per}$	Correction for the active time of the source during the evaluation period in dB
$L_W$	Sound power level in dB(A) per octave (or 1/3-octave), re 1 pW
$D_c$	Directivity correction in dB
$A$	Attenuation (octave-band) in dB per octave (or 1/3-octave)

The attenuation  $A$  is calculated as follows:

$$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{fol} + A_{site} + A_{hous}$$

$A_{div}$	Geometrical divergence in dB
$A_{atm}$	Atmospheric absorption in dB/octave (or 1/3-octave)
$A_{gr}$	Ground effect in dB/octave (or 1/3-octave)
$A_{bar}$	Screening in dB/octave (or 1/3-octave)

$A_{fol}$	Attenuation due to foliage in dB/octave (or 1/3-octave)
$A_{site}$	Attenuation due to installations on an industrial site in dB/octave (or 1/3-octave)
$A_{hous}$	Attenuation due to housing in dB

The modelling inputs and outputs are presented in Appendix C-2. In developing the model all operational sources are deemed on or off for the time period, i.e., where a noise is on during the night-time, it is calculated as been on for the full 8-hour period and operating at full duty capacity. In reality, many emissions within the development will operate below duty capacity, as the power transmission will be related to the power generation (solar dependent) and power transmission (grid requirement dependent). As such this model presents a worst-case scenario for most hours.

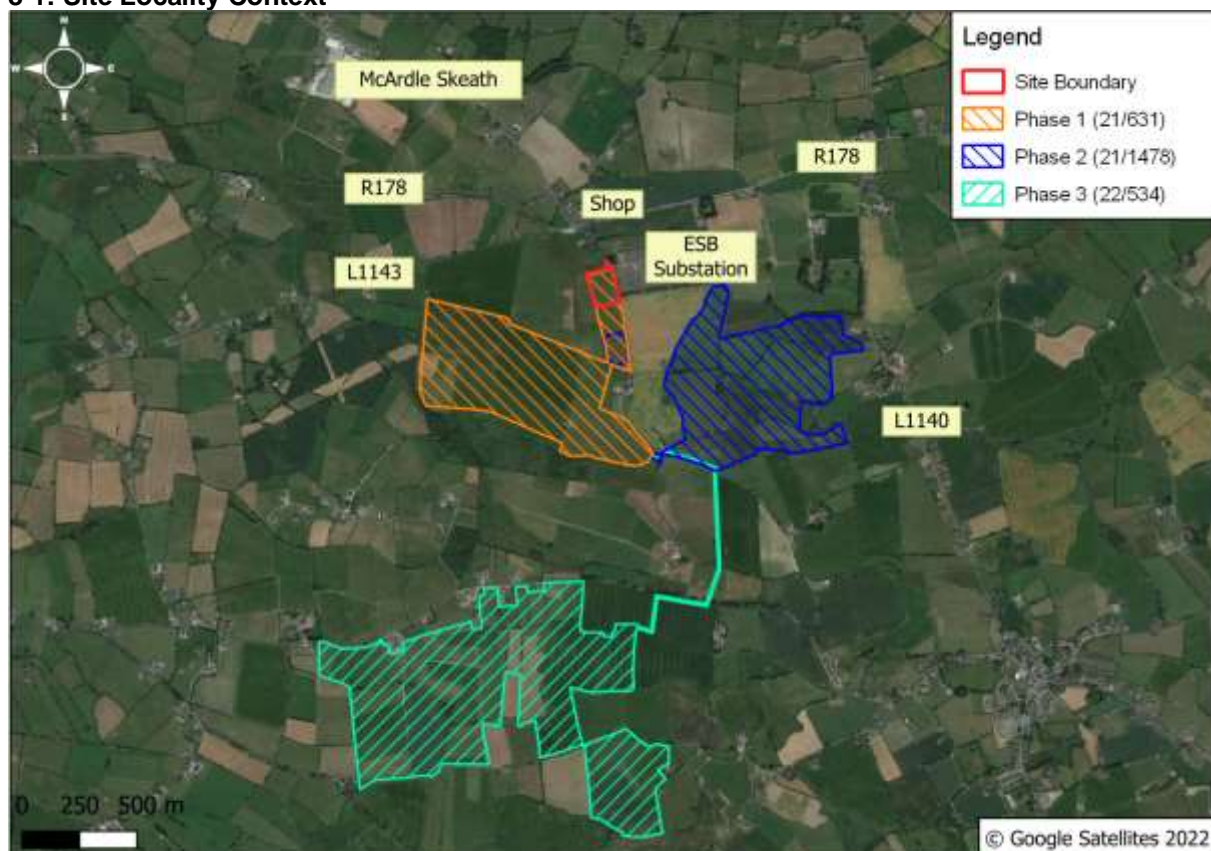
## 8.3 Receiving Environment

### 8.3.1 Site Characterisation

The key acoustic features in the locality (refer to Figure 8-1) have been identified as follows:

- Traffic on the adjacent roads and surrounding road network, namely the L1143 and R178 to the north and L1140 to the east of the Site.
- Customers to the shop to the north of the Site along the R178
- Flow of Heavy Goods Vehicles (HGVs) to McArdle Skeath;
- Louth ESB 275kV Substation; and
- Agricultural machinery and animals.

8-1: Site Locality Context



## 8.4 Quiet Area Screening

The locality was assessed for ‘Quiet Area’ status as per SI 549/2018 [77]. Currently the only recognised methodology for this assessment in rural areas is within the EPA’s noise guidance document NG4 [78]. As per Section 4 of the NG4 document, an assessment as to whether this rural area could be classified as a ‘Quiet Area’ was conducted. This assessment is a desk-based review and assesses the likely impact on an area from human (anthropogenic) noise sources, such as urban and industrial areas or major infrastructural routes. The assessment is detailed in Table 8-1.

If all the criteria for a ‘Quiet Area’, as listed in Table 8-1 below, are met, alternative methodologies to evaluate the potential impact are utilised. A ‘Quiet Area’ may still have high levels of noise, from other sources, or from local road infrastructure, and additional site monitoring would be required to further characterise the acoustic environment.

**Table 8-1: EPA Assessment Criteria for Rural Quiet Area**

Quiet Area Criteria	Yes / No	Comment
At least 3km from any urban areas with populations greater than 1,000 persons	Yes	Carrickmacross ca.9km west of the Site, population of 5,032 (CSO, 2016) Dundalk ca.10.2km to the northeast of the Site, population of 39,004 (CSO, 2016).
At least 10km from any urban area with a population greater than 5,000 persons	No	
At least 15km from any urban areas with a population greater than 10,000 persons.	No	
At least 3km from any local industry.	No	McArdle Skeath supply chain management services ca.2.2km north of the Site.
At least 10km from any major industry centre.	No	Carrickmacross with industrial centres ca.9km west of the Site.
At least 5km from any National Primary Route.	No	N2 National Road ca.5km southwest of the Site.
At least 7.5km from any Motorway or Dual Carriageway.	Yes	No Motorway or Dual Carriageway within 7.5km
<b>Finding</b>		<b>Not a Quiet Area. Proximity to local industrial premises, urban areas and national road.</b>

\*Sources: CSO, Google Maps and www.myplan.ie

## 8.5 Noise Sensitive Receptors (NSRs)

To assess potential noise impacts, local Noise Sensitive Receptors (NSRs) were identified and characterised. NSRs are defined in EPA NG4 as:

*‘any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels’.*

NSRs identified previously (acoustic assessments supporting planning submissions PR 21/1478, 21/631 and 22/534) have been kept for consistency. The locations of existing and newly identified NSRs in the vicinity of the Site are outlined in Table 8-2 and shown in Figure 8-2.

**Table 8-2: NSRs in the Vicinity of the Site**

NSR ID	Orientation to Site	Eastings (ITM)	Northing (ITM)	Distance to Site Boundary (m)	Notes
NSR01	North	693843	803072	ca. 115	Dwelling to the north of the existing Louth ESB Substation

NSR ID	Orientation to Site	Eastings (ITM)	Northing (ITM)	Distance to Site Boundary (m)	Notes
NSR02	North	693566	803034	ca. 274	Dwelling located to the north along the L1143 local road.
NSR03	Northwest	692985	802956	ca. 834	Dwelling located to the northwest along the L1143 local road.
NSR04	Northwest	692892	802832	ca. 931	Proxy for houses located northwest of the Site.
NSR05	South	693193	801916	ca. 1091	Proxy for houses located south of the Site.
NSR06	Southeast	694173	801689	ca. 1130	Proxy for houses located southeast of the Site
NSR07	East	694005	802460	ca. 341	Closest building. Discounted as an NSR as the property will not be habitable during the operation of the Proposed Development.
NSR08	East	694996	802431	ca. 1097	Proxy for houses located further east of the Site.
NSR09	Northeast	694811	802916	ca. 856	Proxy for houses located northeast of the Site.
NSR10	North	694314	803158	ca. 440	Proxy for houses located further north of the Site.
NSR11	East	695046	802613	ca. 1099	Dwelling to the east of the Site.
NSR12	East	695030	802680	ca. 1073	Dwelling to the east of the Site.
NSR13	West	692634	802785	ca. 1192	Dwelling to the west of the Site.
NSR14	West	692428	802508	ca. 1451	Dwelling to the west of the Site.
NSR15	Southwest	692842	801921	ca. 1330	Proxy for dwellings to the southwest of the Site.
NSR16	South	694710	801828	ca. 1225	Proxy for dwellings to the South of the Site.

**Figure 8-2: Location of NSRs and Noise Monitoring Locations in the Vicinity of the Site**



## 8.6 Ambient Noise Characterisation

MOR conducted ambient noise monitoring in the locality of the Site, to characterise the locality in terms of existing sound pressure levels and sources of noise. The monitoring locations are described in Table 8-3 below and are shown in Figure 8-2 above.

**Table 8-3: Noise Monitoring Locations**

Monitoring Location ID	Easting (ITM)	Northing (ITM)	Description of Locality
NM1	693983	802462	Located to the south and west of the Site
NM2	694859	802721	Located to the east of the Site
NM3	694678	801838	Located to the south of the Site
NM4	693584	803030	Located to the North of the Site

Weather conditions during the 21<sup>st</sup> of October day-time monitoring event were Calm to Light Breeze (wind speed 0-3.3m/s) and bright with cool air temperatures (ca.10°C). Ground conditions were dry.

Weather conditions during the night-time monitoring event were Calm to Light Breeze (wind speed 0-3.3m/s) and bright with cool air temperatures (ca.7-8°C). Ground conditions were dry.

Weather conditions during the 26<sup>th</sup> of October night-time monitoring event were Calm to Light Breeze (wind speed 0-3.3m/s) and bright with cool air temperatures (ca.8-9°C). Ground conditions were dry.

The closest meteorological synoptic station is Ballyhaise, Co. Cavan ca. 50km northwest of the Site. The summary of the Met Éireann weather data from this synoptic station on the day of the monitoring event is shown in Table 8-4. Hourly weather data is described in Appendix C-3.

**Table 8-4: Summary 1-hour weather results during acoustic survey**

Date	Rainfall (mm)	Max Temp °C	Min Temp °C	Mean Wind Speed (knots)	Maximum Gusts (if >34 knots)
21/10/2021	0.5	10.9	4.0	5.6 (2.9m/s)	-
22/10/2021	0.5	12.5	7.8	5.4 (2.8m/s)	-
26/10/2021	16.0	16.9	9.2	11.2 (5.8m/s)	-

The summary results from the noise monitoring event are shown in Tables 8-5 and 8-6. The time duration ‘T’ for each monitoring event were:

- 30 minutes during the daytime; and,
- 15 minutes during night-time.

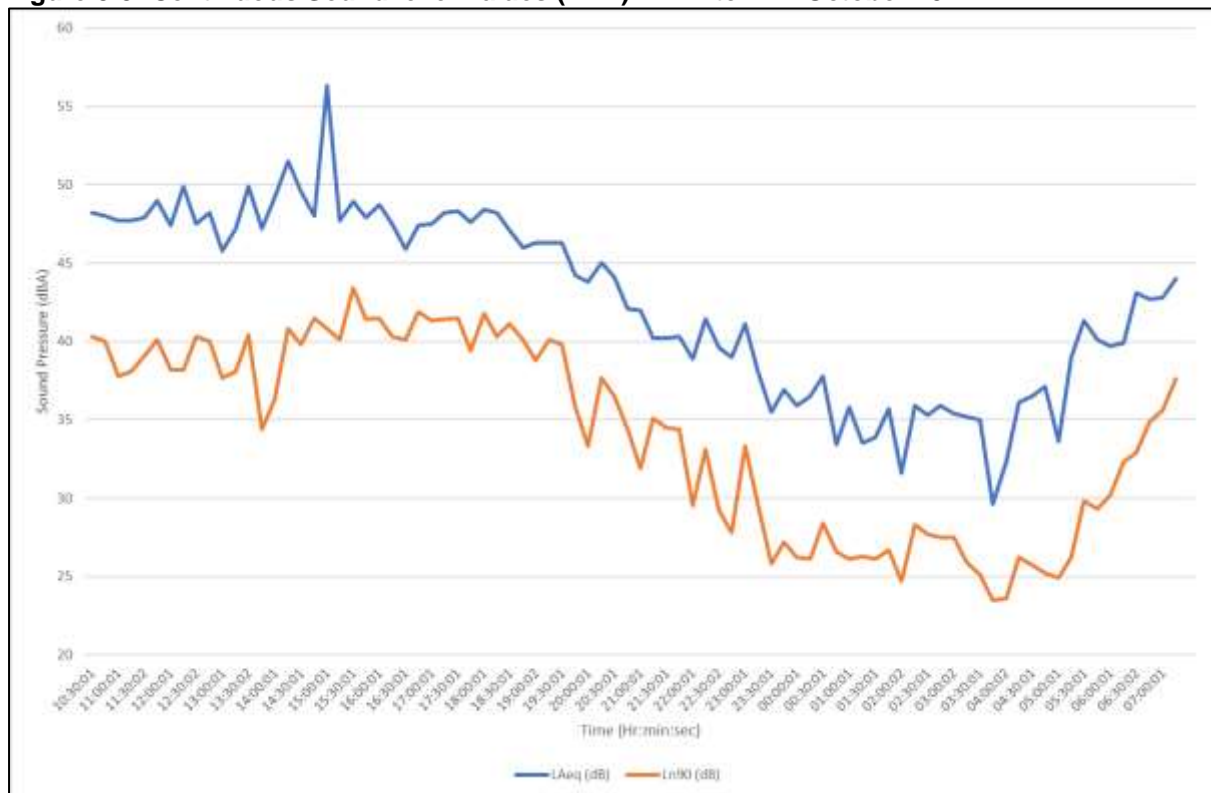
Daytime and night-time measurements were taken twice. This provides 60 minutes of data per location during daytime periods and 30 minutes of data during night-time periods.

In addition to attended short term monitoring, NM4 was set up to monitor continuously throughout the daytime and night-time hours on the 21<sup>st</sup> and 22<sup>nd</sup> of October 2021. Table 8-5 provides the duration ‘T’ for each monitoring period reported for NM4, along with the results from the time-period. Figure 8-3 below presents the  $L_{Aeq,15min}$ , and  $L_{A90,15min}$  over the continuous monitoring period at NM4.

**Table 8-5: NM4 Continuous Noise Monitoring**

Location ID	Time	Duration ‘T’	$L_{Aeq,T}$	$L_{AF90,T}$	$L_{AFmax}$	Commentary
NM4 Day (10:30 – 23:00)	21/10/2021 10:30	12hours 30 min	48	37	81	Birdsong, bird call audible. Traffic passing on adjacent road frequently audible.
NM4 Night (23:00 – 04:00)	21/10/2021 23:00	5 hours	36	26	62	Traffic passing on adjacent road occasionally audible.
NM4 Night (04:00 – 07:00)	22/10/2021	3 hours	40	26	62	Birdsong, bird call audible. Traffic passing on adjacent road infrequently audible.

**Figure 8-3: Continuous Sound level Values (NM4) 21<sup>st</sup> into 22<sup>nd</sup> October 2021**



**Table 8-6: Ambient Attended Daytime Noise Monitoring Results 21<sup>st</sup> and 26<sup>th</sup> October 2021**

Location ID	Time	L <sub>Aeq,T</sub>	L <sub>AF90,T</sub>	L <sub>AFmax</sub>	Commentary
<b>NM1 Day</b>	21/10/2021 12:05	57	39	74	Wind speed 1-3m/s. Birdcall, birdsong and cow's lowing occasionally audible. Distant traffic on L1143, R178 audible. Traffic on unnamed road to the east audible.
	21/10/2021 13:27	44	39	64	ESB Substation continuously audible. Occasional overhead commercial aircraft audible. Run 1 – chainsaw audible for ca.5minutes to the south.
<b>NM2 Day</b>	26/10/2021 08:38	45	42	60	Wind speed 1-3m/s. Birdcall, birdsong, occasional dog barking audible. Substation audible.
	26/10/2021 09:09	47	43	58	Overhead commercial aircraft occasionally audible. Distant traffic to the north, west audible. Occasional traffic to the east audible.
<b>NM3 Day</b>	21/10/2021 11:20	45	38	60	Wind speed 1-3m/s. Birdcall, birdsong, occasional dog barking audible.
	21/10/2021 12:48	44	37	58	Distant traffic to the north audible. Occasional traffic on adjacent road audible. Chainsaw to the north occasionally audible.

**Table 8-7: Ambient Attended Night-time Noise Monitoring Results 22<sup>nd</sup> and 26<sup>th</sup> October 2021**

Location ID	Time	L <sub>Aeq,T</sub>	L <sub>AF90, T</sub>	L <sub>AFmax</sub>	Commentary
<b>NM1 Night</b>	22/10/2021 05:45	39	34	54	Wind speed 1-3m/s. Birdcall, birdsong and cow's lowing occasionally audible. Distant traffic on L1143, R178 audible.
	22/10/2021 06:29	40	35	69	Traffic on unnamed road to the east audible. ESB Substation continuously audible. Run 2 – dog barking audible.
<b>NM2 Night</b>	26/10/2021 05:58	48	43	55	Wind speed 1-3m/s. ESB Substation audible.
	26/10/2021 06:14	46	42	52	Distant traffic to the north and west audible. Occasional traffic to the east audible.
<b>NM3 Night</b>	22/10/2021 05:21	39	30	61	Wind speed 1-3m/s. ESB Substation faintly audible. Distant traffic to the north audible. Vehicle passing on adjacent road audible for both Runs.

Frequency charts along with images from each of the monitoring locations are included in Appendix C-4.

The ambient sound environment was influenced by traffic noise on the local road network, activities associated with the commercial and industrial premises to the north, overhead planes and agriculture during the daytime period. The ambient sound environment was influenced by occasional traffic and animal calls during the night-time monitoring events.

Table 8-8 details the ambient sound characteristics that can be assigned to the identified NSRs based on the similarities between the ambient monitoring locations (NM1 – NM4) and the NSR locations, including proximity to road infrastructure other identified sources of sound during the survey.

**Table 8-8: NSR Ambient Noise Characteristics**

NSR	Monitoring ID	L <sub>Aeq,T</sub> Range (dB)	L <sub>AF90,T</sub> Range (dB)	L <sub>AFmax</sub> Peak Event (dB)
NSR 08 NSR 09 NSR 11 NSR 12	NM2 (day) NM2 (night)	45-47 46-48	42-43 42-43	60 55
NSR 05 NSR 06 NSR15 NSR16	NM3 (day) NM3 (night)	44-45 39-44	37-38 30-35	60 64

NSR	Monitoring ID	L <sub>Aeq,T</sub> Range (dB)	L <sub>AF90,T</sub> Range (dB)	L <sub>AFmax</sub> Peak Event (dB)
NSR 01				
NSR 02				
NSR 03				
NSR 04	NM4 (day)	48	37	81
NSR 10	NM4 (night)	36	26	93
NSR 13				
NSR14				

Utilising the values recorded and the methodology outlined in the EPA's NG4, an assessment for 'Low Background Noise' was conducted.

The monitoring location NM4 based on this survey event meets the criteria for 'Low Background Noise Areas' due to the recorded values below the respective L<sub>A90,T</sub> values of 40dB (7am to 7pm) and 30dB (11pm to 7am).

## 8.7 Applicable Noise Criteria

### 8.7.1 Construction Stage Criteria

A review of noise nuisance criteria in Ireland was conducted. For construction stage noise, the limits and methodology within the British Standard BS5228-1 were used, which are designed for the assessment of noise arising from construction and open sites.

This standard identifies a methodology (the ABC method, Section E.3.2 of Standard) for assigning construction noise limits at NSRs based upon the existing ambient noise levels. An excerpt detailing the ABC method is shown Table 8-9.

**Table 8-9: Maximum Permissible Construction Noise Levels at the facade of dwellings**

Assessment category and threshold value period (L <sub>Aeq</sub> )	Threshold value, in decibels (dB)		
	Category A <sup>A)</sup>	Category B <sup>B)</sup>	Category C <sup>C)</sup>
Night-time (23:00-07:00)	45	50	55
Evening and weekends <sup>D)</sup>	55	60	65
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65	70	75
<b>Note 1</b>	A significant effect has been deemed to occur if the total L <sub>Aeq</sub> noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.		
<b>Note 2</b>	If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L <sub>Aeq</sub> noise level for the period increases by more than 3dB due to construction activity.		
<b>Note 3</b>	Applied to all residential receptors only.		
<b>A)</b>	Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.		
<b>B)</b>	Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.		
<b>C)</b>	Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.		
<b>D)</b>	19:00-23:00 weekdays, 14:00-23:00 Saturday and 07:00-23:00 Sunday.		

Arising from the survey completed by MOR, the local NSRs were 'Category A' receptors and thereby the following construction limits will apply at NSRs:

- Daytime (7am to 7pm Monday to Friday, & 7am to 2pm Saturday) -  $L_{Aeq,1hour}$  65dB.

In the event emergency works are required outside of 'normal' hours, the following noise limits would be applicable for such construction stage works.

- Evening & Weekends -  $L_{Aeq,1hour}$  55dB; and,
- Night-time (11pm to 7am) –  $L_{Aeq,1hour}$  45dB.

### 8.7.2 Operational Stage Criteria

Although a single figure limit value is a preferred option for noise compliance, an assessment of the likely change from the existing ambient acoustic environment is typically a more accurate representation for the likely impact from a Proposed Development. There are two general methodologies for assessing the change in terms of acoustics:

- BS4142:2014; and,
- IOA/EIMA.

The IOA/EIMA guidelines have been utilised in this assessment for noise impact arising from the potential for change to the local acoustic environment.

For monitoring location NM4, as it meets the criteria for 'Low Background Noise Area' as stated above. The noise criteria limit, as stated within EPA NG4 [69], for the Noise Sensitive Locations using this monitoring as a proxy location will be:

- $L_{Ar,T}$  45dB for daytime; and,
- $L_{Aeq,T}$  35dB for night-time.

For all other baseline monitoring locations, the NSLs linked to these, will utilise the standard EPA criteria for daytime and night, which are:

- $L_{Ar,T}$  55dB for daytime; and,
- $L_{Aeq,T}$  45dB for night-time.

#### 8.7.2.1 Acoustic Change

Although the methodology of compliance against a set limit is a robust method on the development of a noise assessment, the human perception of noise is generally better reflected through a review of the change to the existing ambient environment from the Proposed Development.

Although there are various methodologies, in relation to this application the methodology of the IOA/EIMA Guidelines for Environmental Noise Impact Assessment [79] have been followed. Figure 8-4 below presents the relationship between noise impact and noise effect in generating an understanding of significance from the change to an acoustic environment.

**Figure 8-4: IEMA IOA Table on Relationship between Impact and Noise Effect**

MAGNITUDE (Nature of Impact)		DESCRIPTION OF EFFECT (on a specific sensitive receptor)	SIGNIFICANCE (as required within EIA)
Substantial	<b>BENEFICIAL</b>	<b>Receptor perception = Marked change</b> Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	<p><b>More Likely to be Significant</b> (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect)</p> <p style="text-align: center;">↕</p> <p>(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect)</p> <p><b>Less Likely to be Significant</b></p>
Moderate		<b>Receptor perception = Noticeable improvement</b> Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
Slight		<b>Receptor perception = Just noticeable improvement</b> Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	
<b>Negligible</b>		<b>N/A = No discernible effect on the receptor</b>	<b>Not Significant</b>
Slight	<b>ADVERSE</b>	<b>Receptor perception = Non-intrusive</b> Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	<p><b>Less Likely to be Significant</b> (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect)</p> <p style="text-align: center;">↕</p> <p>(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect)</p> <p><b>More Likely to be Significant</b></p>
Moderate		<b>Receptor perception = Intrusive</b> Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance <sup>41</sup> . Affects the character of the area such that there is a perceived change in the quality of life.	
Substantial		<b>Receptor perception = Disruptive</b> Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	
Severe		<b>Receptor perception = Physically Harmful</b> Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	

In forming an assessment on the impact, this methodology looks at the following key elements:

- The change from the baseline presented by the Proposed Development;
- Type of noise source;
- Nature of the change; and,
- Other factors.

The guidance further identifies that the impact assessment should consider the following influences:

- Averaging period;
- Time of day;

- Nature of the noise source (intermittency, etc.):
- Frequency of occurrence;
- Spectral characteristics;
- Absolute level of the noise indicator; and,
- Influence of the noise indicator used.

## 8.8 Noise Emission Sources

### 8.8.1 Construction Phase

As stated in Section 11, due to the fact that the Proposed Development will be constructed in tandem with the Permitted Developments, the construction programme, indicative phasing and construction details have been prepared on the basis of one construction project.

A typical construction timeline for a 240,657no panel solar farm, 102no. battery storage containers and onsite substation is outlined in Table 8-10. This is an indicative Construction Programme with corresponding construction related traffic. The entire construction, including mobilisation of the solar farm and battery storage facility is anticipated to last for approximately 14 months.

The construction works related for the Proposed Development will consist of four main phases:

1. Site clearance and Site Setup;
2. Installation of Substation;
3. Cabling and Ducting; and,
4. Connections and Commissioning.

A cumulative impact for the Proposed Development and Permitted Developments for the construction noise will be assessed.

**Table 8-10: Sources of Construction Noise**

Phase	Likely Noise Sources	Predicted Truck Movements	Notes
Phase 1 – Site Clearance Site Setup	The Substation area will require soil excavation and levelling. Onsite machinery for access road development, parking area development, perimeter fencing (post driving into ground)	5 to 10 deliveries daily	Weeks 0-15
Phase 2 – Installation of Substation	Installing frames (piling or earth anchor installation), assembling metal frames, and installing site structures and buildings.	10-19 deliveries daily	Weeks 15 to 40
Phase 3 – Cabling and Ducting	Digging and covering of trenches for cables.	5-12 deliveries daily	Weeks 35 to 50
Phase 4 – Connections and Commissioning	Specialist trades – no likely heavy plant or machinery required.	Max 5 deliveries daily	Weeks 50 to 60

The movements of workers to and from the Site were not assessed within this report. All worker movements will likely peak during the hours of 7am to 8:30am in the morning and 5:30pm to 6pm in the evening with associated vehicle movement on the public road network. This temporary additional construction traffic in respect of the overall annual average daily traffic volumes is expected to be negligible in relation to existing traffic on the surrounding road network and to coincide with general commuter traffic in terms of its acoustic profile.

The order of the construction phases and the precise work schedule within each phase will be determined by the successful contractor at the tendering stage. This Noise Impact Assessment was based on the notable noise emission sources anticipated during the construction works and a typical duration and schedule of works, which are outlined in Table 8-11.

**Table 8-11: Predicted Noise Emissions – Construction Phase**

Phase	Plant	Sound Pressure at 10m $L_{Aeq,T}$ , dB	Combined Sound Pressure, at 10m, $L_{Aeq,T}$ dB
Phase 1	JCB	67	77
	Fencing hammer piling	77	
Phase 2	Frame Construction	73	80
	Site structures development	79	
Phases 2 & 3	Site structures development	79	79
	Cable trenching	67	
Phase 4	Commissioning	50	50

The construction plant and machinery will change as the project develops, with plant and equipment only operating within any section of the Site for a relatively short period of time. The above construction programme includes for the installation of solar panels and associated cabling transformers and inverters across the Site.

Construction noise associated with Proposed Development will not be positioned in any one particular area of the site for a prolonged period, though the installation of the solar array frames, arising from their positioning across the Site and the duration of the works on their installation, is predicted to be the primary characteristic noise source arising from the solar PV construction phase.

An assessment of the noise exposure, associated with the plant identified in Table 8-11 above, during the various stage has been undertaken. The methodology assessed sound attenuation over distance, based on the methodologies of BS5228 and ISO 9613, for distance attenuation of sound.

A construction noise impact assessment was undertaken for all NSRs in proximity to the Permitted Development. Arising from the localised impacts associated with the construction elements, and the area of land involved, a cumulative impact assessment has been assessed below.

Table 8-12 below details the predicted construction phase noise impact at NSRs utilising the BS5228 ABC Method for maximum noise associated with site structures development ( $L_{Aeq,T}$  of 80dB)

**Table 8-12: NSR Construction Limits Values**

NSR	NML ID (proxy)	Ambient Baseline $L_{Aeq,T}$	Rounded value (closest 5dB)	ABC Limit
NSR01	NM4	48	50	65
NSR02	NM4	48	50	65
NSR03	NM4	48	50	65
NSR04	NM4	48	50	65
NSR05	NM3	44	45	65
NSR06	NM3	44	45	65
NSR08	NM2	45	45	65
NSR09	NM2	45	45	65
NSR10	NM4	48	50	65
NSR11	NM2	45	45	65
NSR12	NM2	45	45	65
NSR13	NM4	48	50	65
NSR14	NM4	48	50	65
NSR15	NM3	44	45	65
NSR16	NM3	44	45	65

**Table 8-13: Construction Noise Impact Assessment (BS5228-1 ABC Method)**

NSR	Distance to Proposed Development Boundary (m)	Predicted Site Specific Sound Pressure Level at NSR Façade $L_{Aeq,T}$ dB	Measured Ambient Sound $L_{Aeq,T}$ dB	Combined Noise Level (Predicted + Measured) $L_{Aeq,T}$	'ABC' Threshold Compliant
NSR01	115	59	48	59	Yes
NSR02	274	51	48	53	Yes
NSR03	834	42	48	49	Yes
NSR04	931	41	48	49	Yes
NSR05	1,091	39	44	45	Yes
NSR06	1,130	39	44	45	Yes
NSR08	1,097	39	45	46	Yes
NSR09	856	41	45	47	Yes
NSR10	440	47	48	51	Yes
NSR11	1,099	39	45	46	Yes
NSR12	1073	39	45	46	Yes
NSR13	1,192	38	48	48	Yes
NSR14	1,451	37	48	48	Yes
NSR15	1,330	37	44	45	Yes
NSR16	1,225	38	44	45	Yes

Utilising the ABC method all NSRs have been predicted to be compliant with construction noise thresholds, as presented in Table 8-13.

### 8.8.1.1 Cumulative and In-Combination Impacts

The Permitted Developments (PR 21/631, PR 21/1478, PR22/534) will be constructed with the Proposed Development. The values in Table 8-14 below provides the cumulative noise impact assessment at all NSRs.

**Table 8-14: Construction Cumulative Noise Impact Assessment**

NSR	Measured Ambient Sound Pressure Level $L_{Aeq,T}$	Predicted Site Specific Sound Pressure Level at NSR Façade $L_{Aeq,T}$ dB	Construction Predicted Site Specific Sound Pressure Level $L_{Aeq,T}$ dB (21/631)	Construction Predicted Site Specific Sound Pressure Level $L_{Aeq,T}$ dB (21/1478)	Combined Noise Level (Predicted + Measured Ambient) $L_{Aeq,T}$
NSR01	48	59	54	63	65
NSR02	48	51	51	57	59
NSR03	48	42	56	56	59
NSR04	48	41	54	54	58
NSR05	44	39	51	49	54
NSR06	44	39	52	48	54
NSR08	45	39	41	61	61
NSR09	45	41	42	57	57
NSR10	48	47	NA	52	54
NSR11	45	39	NA	71	71
NSR12	45	39	NA	65	65
NSR13	48	38	NA	47	51
NSR14	48	37	NA	45	50
NSR15	44	37	NA	47	49
NSR16	44	38	NA	50	51

**Table 8-15: Construction Noise Impact Assessment (BS5228 ABC Method)**

NSR	Combined Noise Level (Predicted + Measured Ambient $L_{Aeq,T}$ )	Ambient $L_{Aeq}$ , rounded to 5dB	ABC Criteria	ABC' Threshold Compliant for main Site
NSR01	65	50	65	Yes
NSR02	59	50	65	Yes
NSR03	59	50	65	Yes
NSR04	58	50	65	Yes
NSR05	54	45	65	Yes
NSR06	54	45	65	Yes
NSR08	61	45	65	Yes
NSR09	57	45	65	Yes
NSR10	54	50	65	Yes
NSR11	71	45	65	<b>No</b>
NSR12	65	45	65	Yes
NSR13	51	50	65	Yes
NSR14	50	50	65	Yes
NSR15	49	45	65	Yes
NSR16	51	45	65	Yes

All NSRs identified will experience less than a  $L_{Aeq,1hr}$  of 65dB, due to the distances between NSRs and the proposed construction works excepts for NSR11 ( $L_{Aeq,1hr}$  71dB). The exceedance from NSR11 is related to the construction noise predicted from Phase 2 (PR 21/1478) arising from the proximity to the Site boundary associated with primarily solar frame piling. Mitigation to manage this programme of construction will be implemented. This noise effect will be for a short duration as construction works are near these properties, mitigation measures from construction works are outlined in Section 8.9.

This assessment assumes all onsite plant is operating at the closest point of the boundary to these receptors for a constant duration of 1hour.

## 8.8.2 Operational Phase

Air circulation into the substation is via a simple mechanical fan. The substation houses the relevant electric transformers to step power supply from medium voltage within the solar PV farm to suitable voltage to be received by the National Grid.

### 8.8.2.1 Proposed Development

The drawings for the Proposed Development were reviewed by a principal MOR acoustician to assess likely sources of noise emissions during operation. No other sources were deemed significant.

Figure 8-5 shows the location of the operational noise source onsite.

**Figure 8-5: Proposed Development Operational Noise Sources**



An assessment of the noise arising from the noise emission source, and the sound power level (the emission at source), is provided in Table 8-16 below.

The noise values have been provided by the Client. As no octave band data have been provided, a flat spectrum is considered within the noise model. The sound emission utilised for this assessment should be taken as tender criteria for suppliers. The Proposed Development only considers 1No. Power Transformer and 2No. House Transformers from the clients side, however the ESB transformers were also included within the noise modelling to represent a predicted worst-case scenario from the future operational development.

Noise modelling utilising the sound power value in Table 8-16 below were performed to assess the  $L_{Aeq,T}$  operational noise levels at NSRs.

**Table 8-16: Predicted Noise Emissions - Operational Phase of The Proposed Development**

Plant/Equipment Type	Technical Details	Reported Sound Power dB(A) at source	Sound Pressure dB(A) at 10m <sup>1</sup>
Power Transformer	110kV. Transformer energised at rated voltage with all fans running.	89	61
House Transformer	33kV	40	12

The predicted operational stage noise levels of the Proposed Development at NSRs clearly demonstrate that the noise emission will be low during normal activities. Specific noise modelling was completed for the closest NSRs to the Site at either 1.5m height or 4m height, the highest results are shown in Table 8-17 below.

<sup>1</sup> Calculated using standard hemispherical expansion of the sound wave.

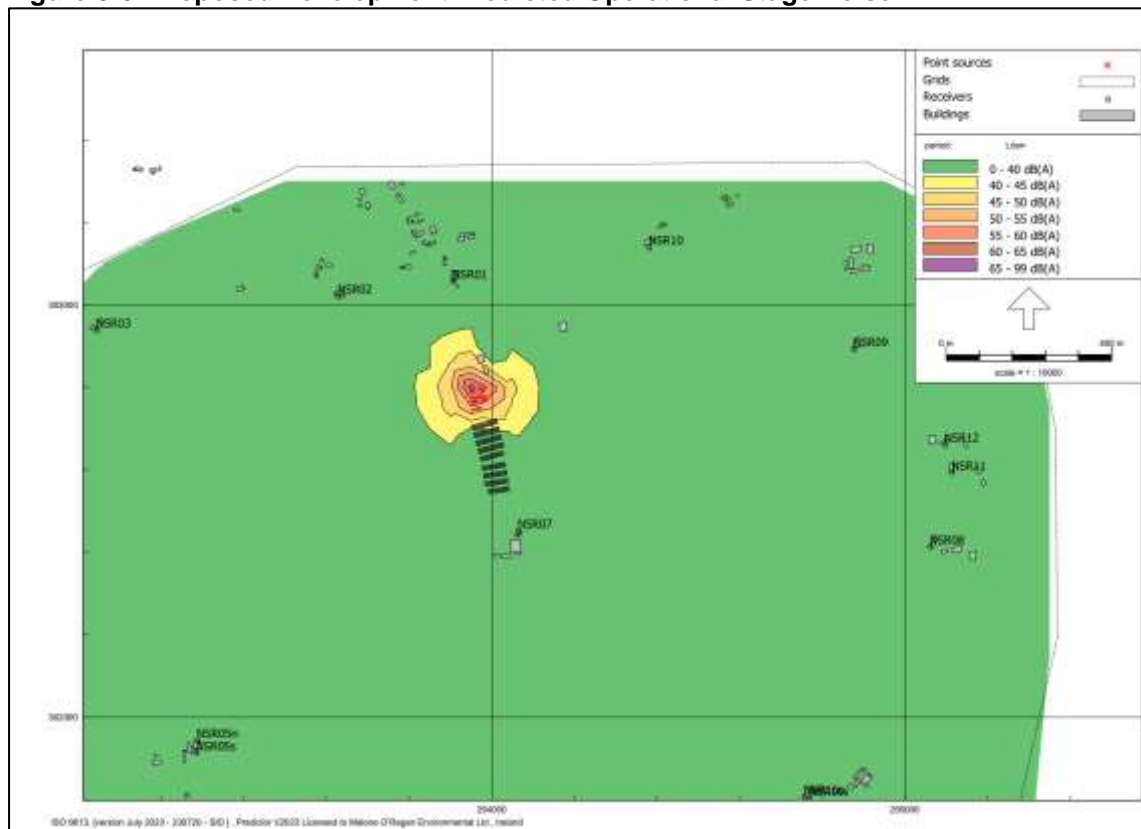
**Table 8-17: Predicted Operational Noise Assessment for the Proposed Development**

NSR	Predicted Sound Pressure Level $L_{Aeq,T}$ dB
NSR01	30
NSR02	25
NSR03	9
NSR04	8
NSR05	9
NSR06	8
NSR08	23
NSR09	7
NSR10	16
NSR11	20
NSR12	9
NSR13	9
NSR14	6
NSR15	5
NSR16	7

Table 8-17 above shows the highest value as  $L_{Aeq,T}$  30dB. This value is low and is in keeping with the general environment recorded in the locality. Based on the low noise arising specifically from the Proposed Development, the operational noise assessment study area is to the closest NSRs, and within 800m.

Figures 8-6 shows predicted operational stage noise levels for the Proposed Development. Beyond the closest NSRs (NSR01 and NSR02) operational noise levels from the Proposed Development were predicted to be less or equal than a  $L_{Aeq,T}$  of 30dB.

**Figure 8-6: Proposed Development Predicted Operational Stage Noise**



### 8.8.2.2 Cumulative Assessment

As the Permitted Developments and this Proposed Development will be constructed in tandem, the developments will be operated simultaneously. The operational stage noise of the cumulative project was assessed from fixed plant across the Site.

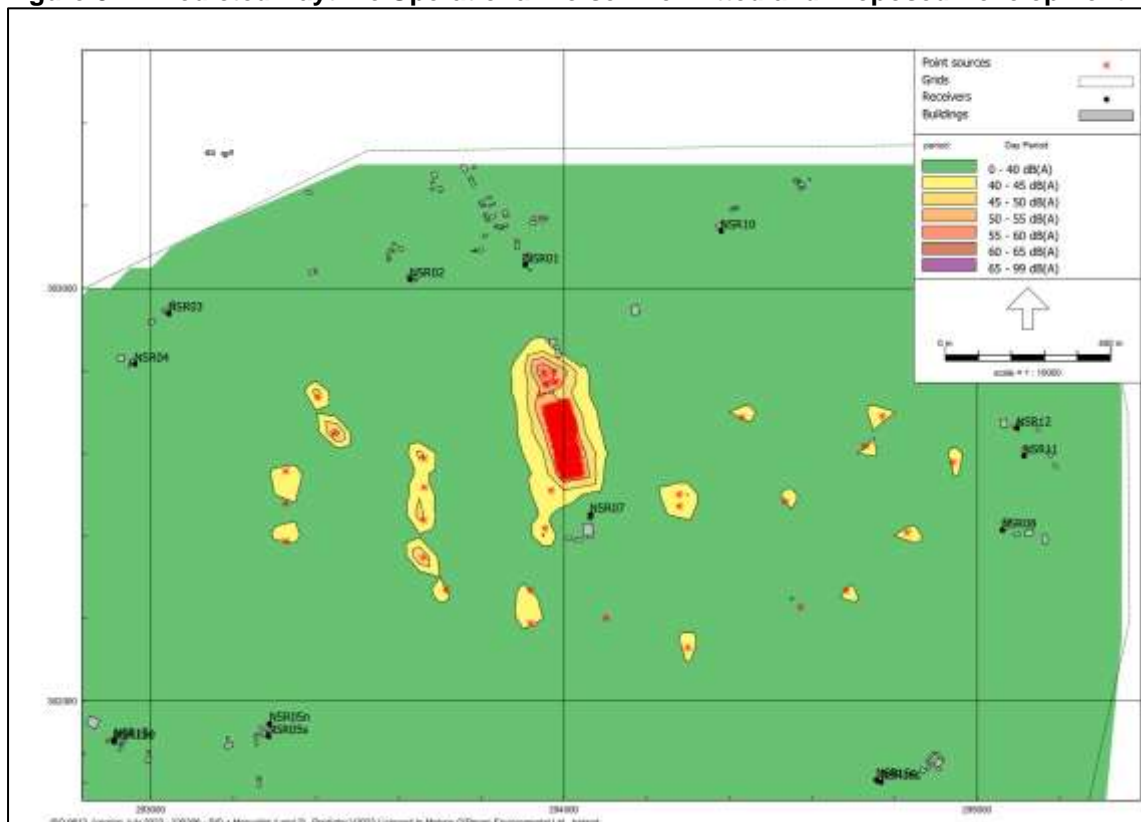
Utilising the predicted operational noise levels associated with the Proposed Development (refer to Table 8-17) and the Permitted Developments (PR 21/631 and PR 21/1478), an assessment was undertaken to determine the likely impact of the noise on nearby NSRs, if any. Due to the distance of the Phase 3 permitted development (PR 22/534) from the sensitive receptors and the Proposed Development they were not included in this cumulative assessment.

The predicted specific noise levels at each NSR represent a predicted 'worst case scenario' for daytime and night-time where all Site-specific noise emissions onsite would be operating at full duty capacity.

Specific noise calculations were completed for the NSRs at either 1.5m (A) or 4m (B) height. As the Proposed Development will operate in two distinct stages due to the type of development as detailed in Section 8.7.2.

Tables 8-18 and 8-19 below assess the change on ambient background ( $L_{A90,T}$ ) and does not utilise the  $L_{Aeq,T}$  recorded values (refer to Tables 8-5, 8-6 and 8-7 above) which were ca. 4-10dB higher due to short term noise events such as passing traffic, dog barking and wind induced noise (trees, hedgerows). Therefore, the change for both daytime and night-time operational noise is worst-case. The results are shown in Figure 8-7 and Tables 8-18 and 8-19.

**Figure 8-7: Predicted Daytime Operational Noise - Permitted and Proposed Development**



**Table 8-18: Predicted Daytime Operational Noise and Calculated Cumulative**

NSR	Existing Ambient Background	Meets EPA Low Background noise Criteria**	Permitted Development (21/631 & 21/1478)	Predicted Proposed Development	Calculated Cumulative	Predicted Change on Background +/-
	LA90,T dB*	LAF90,T 40dB	LAeq,T dB	LAeq,T dB	LAeq,T dB	
NSR01	37	Yes	28	30	38	+1
NSR02	37	Yes	25	25	38	+1
NSR03	37	Yes	18	9	37	0
NSR04	37	Yes	19	8	37	0
NSR05	37	No	22	9	37	0
NSR06	37	No	18	8	37	0
NSR08	42	No	25	7	42	0
NSR09	42	No	25	16	42	0
NSR10	37	Yes	23	20	37	0
NSR11	42	No	23	9	42	0
NSR12	42	No	24	9	42	0
NSR13	37	Yes	14	6	37	0
NSR14	37	Yes	13	5	37	0
NSR15	37	No	20	7	37	0
NSR16	37	No	18	8	37	0

\*lowest value selected.

\*\*both day and night-time criteria to be met to be classified as Low Background noise environment.

**Table 8-19: Predicted Night-time Operational Noise and Calculated Cumulative**

Name	Existing Ambient Background	Meets EPA Low Background noise Criteria**	Permitted Development (21/631 & 21/1478)	Predicted Proposed Development	Calculated Cumulative	Predicted Change on Background +/-
	LA90,T dB*	LAF90,T 30dB	LAeq,T dB	LAeq,T dB	LAeq,T dB	
NSR01	26	Yes	28	30	33	+7
NSR02	26	Yes	25	25	30	+4
NSR03	26	Yes	18	9	27	+1
NSR04	26	Yes	19	8	27	+1
NSR05	30	No	22	9	31	+1
NSR06	30	No	18	8	30	0
NSR08	42	No	25	7	42	0
NSR09	42	No	25	16	42	0
NSR10	26	Yes	23	20	28	+2
NSR11	43	No	23	9	42	0
NSR12	43	No	24	9	42	0
NSR13	26	Yes	14	6	26	0
NSR14	26	Yes	13	5	26	0
NSR15	30	No	20	7	30	0
NSR16	30	No	18	8	30	0

\*lowest value selected.

\*\*both day and night-time criteria to be met to be classified as Low Background noise environment, refer to Section 8.6 above.

The predicted operational noise levels from the specified Permitted Developments and Proposed Development are a worst-case scenario.

The assessment identified 7No. of receptors has been classified as EPA ‘Low Noise’ environment.

During the daytime only 1No. NSR were predicted to experience a change from the measured ambient background  $L_{A90,T}$  of ca. 1dB. NSR01 was predicted to experience a change from the measured ambient background  $L_{A90,T}$  of ca. 1dB during the daytime, however it will remain considerably below the stringent EPA low background noise limit for daytime ( $L_{Ar,T}$  45dB).

The remaining NSRs are not predicted to experience a change to their daytime sound levels from the cumulative noise impact of the Proposed Development and other authorised developments locally.

The WHO Night Noise Guidelines (NNG) [69] recommends that the population should not be exposed to night noise levels greater than 40dB of  $L_{night, outside}$  during the part of the night when most people are in bed. The Site-specific highest noise level predicted at NSRs during the night-time period as  $L_{Aeq,T}$  was 30dB at NSR01. This is substantially lower than the NNG’s recommendation. The NNG also states that even with a bedroom window slightly open, a reduction from outside to inside of 15dB will occur [69].

NSR01 is predicted to experience a change from the measured ambient background  $L_{A90,T}$  of ca. 7dB during the night-time. The modelling shows that the predicted worst-case night-time operational will be compliant with the stringent EPA low background noise limits during night-time ( $L_{Aeq,T}$  35dB) at NSR01, and it will remain substantially below WHO guidelines for NNG.

The remaining NSRs were predicted to experience a night-time change from the measured ambient background  $L_{A90,T}$  of ca. 0-4dB, with these NSRs remaining below the typical EPA noise limits for night-time ( $L_{Aeq,T}$  45dB).

As per Tables 8-18 and 8-19 this assessment represents the worst case assessment. The characteristics of the proposed noise emissions will be similar to the existing acoustic environment and all results showed predicted worst-case values below the EPA’s NG4 low background noise limits at all times at all NSRs.

Therefore, as per IEMA guidelines (refer to Figure 8-4 above) it was predicted the cumulative impact during a worst-case scenario was deemed to be Negligible to Slight resulting in a Not Significant impact at all NSRs.

### **8.8.2.3 Tonal Noise**

Noise modelling utilising generic equipment, inputting 1/1 octave values which is the recommended best practice procedure of ISO 9613 was completed. This is a rapidly developing sector, and the equipment is constantly improving with regards efficiency, size and noise emissions.

However, the noise model has shown, based on currently available plant, the closest receptors would be exposed to a maximum noise emission of  $L_{Aeq,T}$  of 22dB.

No tones were predicted to occur during the operational phase due to the louvre/fan arrangement on battery storage units (within the Permitted Developments), their proposed operational speeds and the distance from onsite noise to NSRs.

## **8.9 Proposed Mitigation Measures**

### **8.9.1 Construction Phase**

The noise levels generated at times during the period of the construction works for the Permitted Developments and Proposed Development were not predicted to reach noise nuisance limits at NSRs except for NSR11 for a short duration time. However, the Applicant is still committed to

implementing standard noise mitigation measures throughout the construction phase of the Proposed Development.

This will include the development of a CEMP, where noise mitigation measures, complaints procedures and monitoring programmes will be clearly defined.

Such measures will include:

- Activities and deliveries to the Site to occur only during permitted hours;
- All plant where possible shall be low noise rated;
- Where necessary enclosures and noise screens shall be used to control noise from plant;
- Erection of acoustic hoarding along boundaries with homes within 20m of the construction works area, where potential construction noise will be above guidance limits;
- Positioning of the Site compound a distance away from the closest NSR;
- Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;
- All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues;
- Working Method Statements will be developed for the Site construction personnel to ensure optimal working procedures are employed, thereby minimising time spent in proximity to NSRs; and,
- A Site Representative will be appointed to receive and respond to noise complaints and enquiries during construction by local residents, the Local Authority and any other regulatory body. Relevant details will be provided to the Local Authority prior to construction, and will be made available to third parties, including local residences.

Utilising the above measures, along with the implementation of a dedicated contractor designed CEMP, will ensure construction works noise will be maintained below a best practice noise nuisance value of  $L_{Aeq,1hour}$  of 65dB at local receptors and therefore no impacts will occur.

### **8.9.2 Operational Phase**

Based on the proposed equipment specification and the layout of the Permitted Developments and Proposed Development, it has been assessed that no noise nuisance impacts will occur at surrounding NSRs for both daytime and night-time cumulative operations and therefore no specific noise mitigation measures will be required.

Regardless, the Applicant has incorporated into the design of the Overall Development additional boundary improvements, including low level embankments, strengthening of hedgerows and additional planting along existing hedgerow boundaries. These measures will further reduce noise emissions from the Site through obstruction of the noise pathway.

### **8.10 Wind Induced Noise**

Wind induced noise through the Site structures can potentially occur in one of two instances:

- Broadband turbulence noise; or,
- Aeolian noise.

Broadband turbulence noise is created by the obstruction by Site infrastructure of the passage of wind, resulting in a broadband noise which is the same for any other structure in the existing environment. Aeolian noise is created by the passage of wind over or through objects and is characterised by tones and whistles that vary in frequency depending on the wind speed.

There is no documented evidence from solar farms operated in either the UK or Europe to suggest that solar farms result in either broadband turbulence noise or Aeolian noise impacts.

It is considered that wind induced noise impacts on identified NSRs caused by broadband and Aeolian noise will be insignificant as the Proposed Development and associated small structures will be dispersed over a relatively large landholding containing both boundary and dividing hedgerows, which will be maintained and reinforced.

Therefore, we conclude that wind induced noise impacts will be similar to wind induced noise through farm gates or fencing and to the existing wind induced noise around buildings and through overhead power lines at the closest NSRs.

### **8.11 Assessment Conclusions**

A comprehensive noise impact assessment was undertaken by a principal MOR acoustician, who is a full member of the Institute of Acoustics (MIOA) and Association of Acousticians of Ireland (AACI).

The assessment included baseline noise monitoring at four locations, which characterised the existing noise environment as ranging from 39dB to 48dB,  $L_{Aeq,T}$  and background levels of 26dB to 43dB  $L_{A90,T}$  during the daytime and night-time periods.

During the construction phase, as per any construction project, the potential exist for temporary noise nuisance during specific construction works. Due to the distance of proposed construction works from the NSRs identified and the general methods what will be involved in constructing ancillary infrastructure, standard construction noise will not breach noise limits at NSRs with exception of NSR11 for a short period.

Nonetheless, noise mitigation measures will be implemented during the construction stage that will be in accordance with recognised best practice guidelines for construction sites. These have been outlined in Section 8.9. Therefore, it is considered likely that noise nuisance will not occur during the construction of the Proposed Development.

Regarding the cumulative operational phase of the Permitted Developments and the Proposed Development, there will be no likely noise nuisance during either the daytime or night-time operation and as such specific mitigation measures were not deemed to be warranted.

## 9 LANDSCAPE AND VISUAL

### 9.1 Introduction

This Landscape and Visual Assessment (LVIA) has been prepared in respect of a planning application for a 2No. 110Kv substation and associated grid connection in the townland of Toomes in County Louth. The LVIA report describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the scheme on the receiving environment.

**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 LVIA uses 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) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements [10];
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013) [79].

#### 9.1.1 Statement of Authority

This Landscape and Visual Impact Assessment report was prepared by Macro Works Ltd; a landscape consultancy firm specialising in LVIA along with associated visibility mapping and photomontage graphics. Relevant experience includes LVIA work for a vast range of infrastructural, industrial and commercial projects since 1999.

#### 9.1.2 The Proposed Development

The proposed 2No. 110kV electrical substation will be superseding the previously permitted 2x37kV substations. Full details of the Proposed Development are available in Section 5.2.1.

#### 9.1.3 Assessment Methodology

Production of this Landscape and Visual Impact Assessment involved:

- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the Louth County Development Plan as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposal;
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the landscape impact of the development as a function of landscape sensitivity weighed against the magnitude of the landscape impact;
- Assessment of the significance of the visual impact of the development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This

aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints; and,

- Incorporation of mitigation measures to reduce potential impacts and estimation of residual impacts once mitigation has become established.

### 9.1.3.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a Proposed Development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and,
- Significance of landscape effects.

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria set out in Table 9-1.

**Table 9-1: Landscape Value and Sensitivity**

Sensitivity	Description
<b>Very High</b>	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
<b>High</b>	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
<b>Medium</b>	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
<b>Low</b>	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
<b>Negligible</b>	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the Site boundary that may have an effect on the landscape character of the area. Table 9-2 refers.

**Table 9-2: Magnitude of Landscape Impacts**

Magnitude of Impacts	Description
<b>Very High</b>	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.

<b>High</b>	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
<b>Medium</b>	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
<b>Low</b>	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
<b>Negligible</b>	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in Table 9-3.

**Table 9-3: Impact Significance Matrix**

	Sensitivity of Receptor				
Scale/Magnitude	<i>Very High</i>	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Negligible</i>
<i>Very High</i>	Profound	Profound-substantial	Substantial	Moderate	Minor
<i>High</i>	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
<i>Medium</i>	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
<i>Low</i>	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
<i>Negligible</i>	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange are considered to be 'significant impacts' in EIA terms.

### 9.1.3.2 Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the Proposed Development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

### 9.1.3.3 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the

landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below and used in Table 9-6 below to establish visual receptor sensitivity at each VRP:

1. **Susceptibility of Receptors** - In accordance with the Institute of Environmental Management and Assessment (“IEMA”) Guidelines for Landscape and Visual Assessment (3rd edition 2013) [79] visual receptors most susceptible to changes in views and visual amenity are;
  - “Residents at home;
  - People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
  - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
  - Communities where views contribute to the landscape setting enjoyed by residents in the area; and,
  - Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened”.

Visual receptors that are less susceptible to changes in views and visual amenity include:

- “People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and,
  - People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life”.
2. **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
  3. **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county’s Landscape Character Assessment, which is then incorporated within the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
  4. **Primary views from dwellings**. A proposed development might be seen from anywhere within a particular residential property with varying degrees of sensitivity. Therefore, this category is reserved for those instances in which the design of dwellings or housing estates, has been influenced by the desire to take in a particular view. This might involve the use of a slope or the specific orientation of a house and/or its internal social rooms and exterior spaces;
  5. **Intensity of use, popularity**. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;

6. **Connection with the landscape.** This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;
7. **Provision of elevated panoramic views.** This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
8. **Sense of remoteness and/or tranquillity.** Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
9. **Degree of perceived naturalness.** Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
10. **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
11. **Historical, cultural and / or spiritual significance.** Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
12. **Rarity or uniqueness of the view.** This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
13. **Integrity of the landscape character.** This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
14. **Sense of place.** This considers whether there is special sense of wholeness and harmony at the viewing location; and,
15. **Sense of awe.** This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity. No relative importance is inferred by the order of listing in the Table 9-5. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

#### **9.1.3.4 Visual Impact Magnitude**

The magnitude of visual effects is determined on the basis of two factors: the visual presence (relative visual dominance) of the Proposed Development, and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects, aside from scale in relation to distance. Some of these aspects include the extent and complexity of the view, as well as the degree of existing contextual movement experienced. The backdrop against which the development is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is often, though not always, expressed as one of the following terms:

- Minimal;
- Sub-dominant;
- Co-dominant;
- Dominant;
- Highly dominant.

The magnitude of visual impacts is classified in Table 9-4.

**Table 9-4: Magnitude of Visual Impact**

Criteria	Description
<b>Very High</b>	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene.
<b>High</b>	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.
<b>Medium</b>	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity.
<b>Low</b>	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
<b>Negligible</b>	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

### 9.1.3.5 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier in respect of landscape impacts, refer to Table 9-3.

### 9.1.4 Extent of Study Area

It is anticipated that the Proposed Development will be difficult to discern and not likely to give rise to significant landscape/townscape or visual impacts beyond 1-2km. Nonetheless for the purposes of a comprehensive appraisal, a 5km study area has been included as part of this assessment, with a particular focus on those receptors within 1km of the site.

**Figure 9-1: Extent of Study Area**

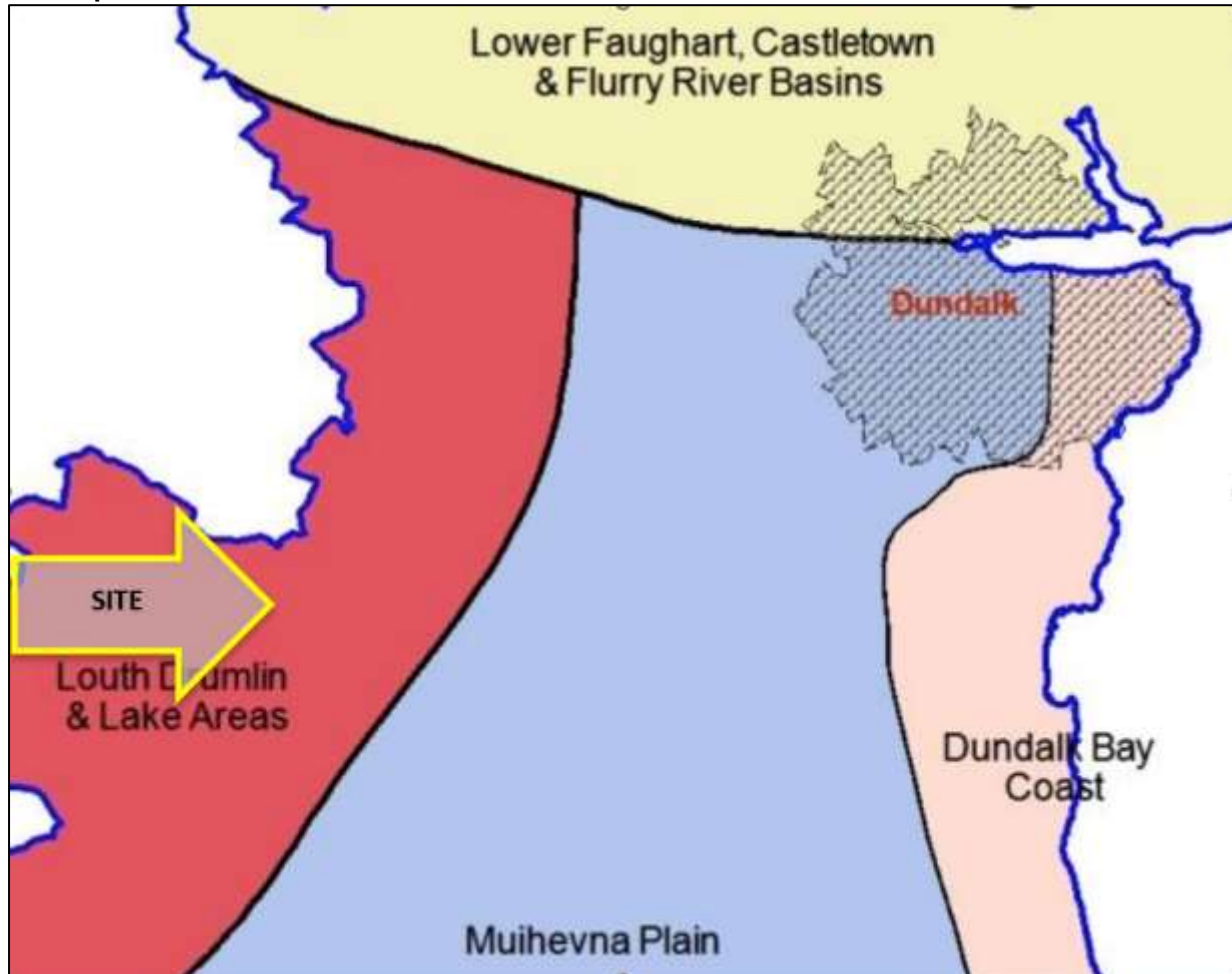


## **9.1.5 Landscape and Visual Policy Context and Designations**

### **9.1.5.1 Louth County Development Plan 2021-2027**

The Louth Landscape Character Assessment (LLCA), which was completed in 2002 for the entire County outside the major towns, is incorporated into Section 8 of the current Louth County Development Plan. Nine Landscape Character Areas in the county were identified by the LLCA, with each representing geographical areas with a particular landscape type or types (refer to Figure 9-2). The site is located within the 'Louth Drumlin and Lakes' Landscape Area, which covers a portion of the county to the northwest, at the border of County Monaghan. Of the four levels of importance assigned to each area (i.e. international, national, regional or local), the Louth Drumlin and Lakes landscape area is deemed to have a 'local' importance.

**Figure 9-2: Map of Landscape Character Areas within County Louth in relation to the Proposed Development.**



According to the LLCA, the key characteristics of the ‘Louth Drumlin and Lake Areas’ entail:

- Southeast tip of the large Drumlin areas extending into Connaught and Ulster.
- Typical landform of the Drumlin glacial drift.
- Areas of biodiversity and ecological interest.
- Sparsely populated in comparison to the rest of the county.
- Strong sense of landscape enclosure created by landform.
- Areas of scrub and rush invasion.
- Dominance of power lines.

In terms of landscape description:

*“The area marks the eastern tip of the Drumlin area, which extends into the reaches of the Shannon and northwest towards Lough Neagh. Land improvement has reduced the low-lying marshy areas enclosed by Drumlins ...”*

It is noted in terms of ‘human intervention’ that *“Electricity power lines are in abundance into and out of the ESB substation at Monvallet”*. In terms of landscape sensitivity: *“The existing hedgerows are generally robust and in themselves add a distinctive feature to the Drumlin landscape. Their removal whilst exposing the drumlin landform would dramatically change the landscape.”*

Chapter 5 of the Louth County Development Plan (CDP) entails heritage (natural & built). Those heritage policies that are relevant to the Proposed Development entail:

### **NBG 23**

*“To ensure the preservation of the uniqueness of a landscape character type by having regard to its character, value and objectives in accordance with national policy and guidelines and the Louth Landscape Character Assessment and by ensuring that new development meets high standards of siting and design and does not unduly damage or detract from the character of a landscape or natural environment.”*

### **NBG 24**

*“To ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types including the retention of important features or characteristics, taking into account the various elements, which contribute to their distinctiveness such as scenic quality, habitats, settlement pattern, historic heritage and land use.”*

### **NBG 25**

*“Where appropriate, require that landscape and visual impact assessments prepared by suitably qualified professionals be submitted with development applications, which may have significant impact on landscape character areas, especially in highly sensitive areas.”*

It should be noted that there are no scenic routes, Areas of Outstanding Beauty or Areas of High Scenic Quality within the study area.

## **9.1.5.2 Monaghan County Development Plan 2019-2025**

County Monaghan occupies the north-western quadrant of the study area beyond the R178 regional road and thus, the landscape sensitivity and scenic route/view designations are potentially relevant. The nearest Landscape Character unit is described as LCT 6 – Flat Riverine Farmland, which lies within the broader Landscape Character Area of LCA 9 – Carrickmacross Drumlin and Lowland Farmland. This is not designated as a highly sensitive landscape and there are no designated scenic routes / views within the study area.

## **9.2 Existing Environment**

### **9.2.1 Landscape Baseline**

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development will be assessed. A description of the landscape context of the proposed application site and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development.

### **9.2.2 Landform and Drainage**

As described within the Louth Landscape Character Assessment (2002), this area is at the easternmost extents of a vast drumlin ‘sea’ that stretches further inland to the northwest. Consequently, the distinctive drumlin hill landform pattern is most prevalent to the area north-west of the Site and dissipates to form low rolling ridge lines in a gently undulating landscape for the remainder of the study area. The principle rivers and streams within the vicinity of the Site are detailed in Section 2.4.

### 9.2.2.1 Vegetation and Land Use

The predominant land cover of the study area (including the site) is good quality pastoral farmland with some tillage and occasional patches of woodland and commercial forestry. As part of the Louth CDP, the Council has identified and recorded trees and groups of trees considered to be of Special Amenity Value within the county. There is a patch of native trees designated under the Tree Preservation Order, to the east of the site. The patch of trees is referenced as 'TWSAV6 - Bullys Acre' in Table 8.7 of the Louth CDP (2021-2027) and is situated ca. 800m east. Otherwise, there is little in the way of urban land cover, but other notable land uses are the existing large electrical substation at Monvallet immediately east of the site and a large rural industrial facility around 1.4km to the northwest.

Figure 9-3: Aerial Image of Site and central study area land cover



### 9.2.2.2 Centres of Population and Houses

The only notable centres of population in the study area are the small villages of Louth and Tallanstown, which lie 2.2km southeast and approximately 5km south of the site, respectively. Otherwise, the study area is lightly populated by farmsteads and rural dwellings lining the web of local roads that occur throughout the study area.

### 9.2.2.3 Transport Routes

The N2 passes the Site just beyond the western outskirts of the study area. Otherwise, the highest order roads within the study area are two regional roads, namely the R178 and R171. The R178 runs in an east-west direction through the middle of the study area passing c. 200m to the north of the site at its nearest point. The R171 passes through the settlement of Louth and runs in a north-easterly and southerly direction from that settlement. It is around 2.4km south of the site at its nearest point

### 9.2.2.4 Tourism, Heritage and Public Amenities

Aside from local sports pitches, the only notable recreational amenity contained within the study area is the Monaghan Way national way-marked walking route, which has its southern terminus in the village of Innishkeen, located in the northern portion of the study area.

### 9.2.2.5 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposal in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed by Macro Works using up to 6 no. categories of receptor type. These are: Key Views (from features of national or international importance); Designated Scenic Routes and Views; Local Community views; Centres of Population; Major Routes; Amenity and heritage features.

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The Viewshed Reference Points selected in this instance are set out in the Table 9-5 and Figure 9-4 below.

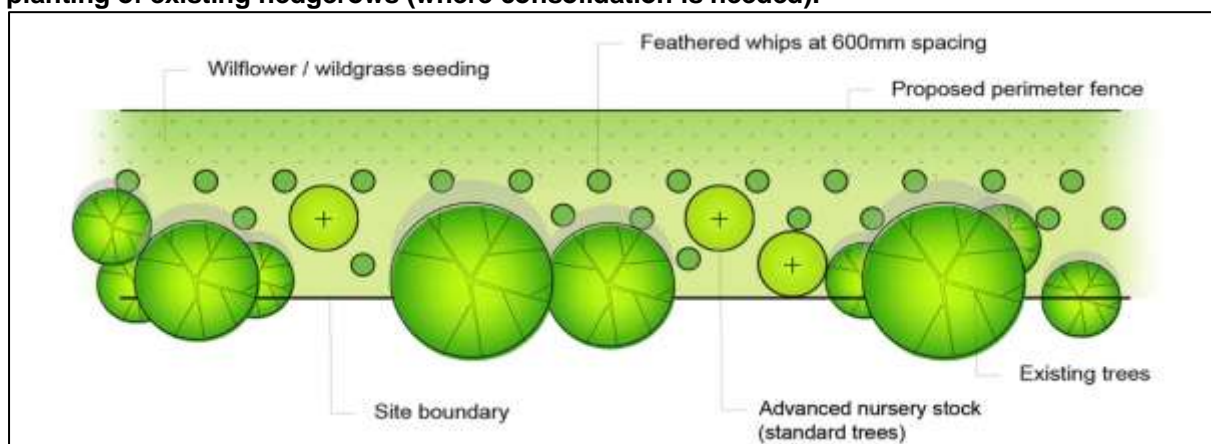
**Table 9-5: Outline Description of Selected Viewshed Reference Points (VRPs)**

VRP No.	Location	Representative of	Direction of view
VP1	Local road north of Ballakelly Bridge	Local community views	S
VP2	Cross roads settlement at Ballakelly Bridge	Locally important road route and local community views.	S
VP3	Cross roads settlement at Carrickadoan	Local community views	SW
VP4	Local road adjacent to Louth ESB substation	Local community views	W
VP5	Local road south east at Carnalughoge	Local community views	NW
VP6	Local road to the southeast of the site	Local community views	NW



Where not already exceeded by existing vegetation, it is intended to manage hedgerows at around 3-4m in height. The consolidated 3-4m height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected internal (Application Site boundaries) side of hedgerows that require densification.

**Figure 9-5:** Indicative boundary planting detail showing the approach to inter-planting and under-planting of existing hedgerows (where consolidation is needed).



The section of the site that contains the substation will also be surrounded by a woodland mix, comprising of a native whip planting mix and advanced nursery stock. This woodland mix will be allowed to grow out to reach maturity at c. 6-8m.

## 9.4 Impact Assessment

### 9.4.1 Landscape Value and Sensitivity

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the site and wider study area. Landscape Character Value and Sensitivity are assessed using the methodology described in Section 9.1.3.

Both the site itself and the surrounding study area represent a fairly typical rural landscape of predominately pastoral farming. Indeed, one of the most distinctive feature of this landscape of this rural landscape is the considerable presence of electrical infrastructure in the form of the large Monvallet substation and the associated high voltage line and pylons that converge on it. The next most distinctive feature is the large rural/industrial facility on elevated ground about 1.4km northwest of the site. These are not necessarily defining features of the landscape, they are simply notable features in a rural landscape setting that is not particularly rare or distinctive. Nonetheless, it is a well utilised rural landscape that is well tended by its custodians with few fallow or degraded areas. The hedgerow network is clearly defined and generally maintained at modest heights, but with some evidence of hedgerow loss over the last century.

As referenced in Section 9.1.5.1 while there is no designated or assigned sensitivity assigned to the landscape of the 'Louth Drumlin and Lakes' in the Louth Landscape Character Assessment, of the four levels of importance assigned to each area in the county (i.e. international, national, regional or local), the Louth Drumlin and Lakes LCA is deemed to have a 'local' importance (i.e. the lowest).

On the basis of the factors outlined above, it may be summarised that the study area is a typical and utilitarian rural environment of modest integrity, which contributes to the economy and amenity of the surrounding population. In general, the central study area is a landscape with forceful productive landscape values rather than evidently picturesque or naturalistic values.

On balance of these reasons, the sensitivity of the receiving landscape is deemed to be **Medium-low**.

#### 9.4.2 Magnitude of Landscape Effects

It is envisaged that the magnitude of landscape effects will be very similar to those predicted as a result of the original Monvallet I Solar Farm application (Ref: 21631) that proposed the construction of two 38kV substations of a similar scale and nature of the 2No. 110kV substations now proposed.

There will be construction stage effects which will involve the clearing and excavating the site to accommodate the proposed substations infrastructure, but this will be of no greater extent / impact than for the permitted substation. During the operational stage there will be impacts on landscape character from the greater intensity of built development in this predominantly rural area and also cumulatively with the existing / adjacent Monvallet Substation. However, as evidenced by the photomontage set (Appendix D), the scale and nature of the proposed development will not increase effects relative to the permitted substation.

For the reasons outlined above, the magnitude of landscape impacts, relative to the baseline scenario of the permitted development, will be **Negligible** and the resulting significance, **Imperceptible**.

#### 9.4.3 Sensitivity of Visual Receptors

**Table 9-6: Scale of Value for Each Criterion**

Strong association	Moderate association	Mild association	Negligible association

**Table 9-7: Analysis of Visual Receptor Sensitivity at Viewshed Reference Points (Refer Figure 9-6 above)**

Values associated with the view	VP1	VP2	VP3	VP4	VP5	VP6
Susceptibility of viewers to changes in views						
Recognised scenic value of the view						
Views from within highly sensitive landscape areas						
Primary views from residences						
Intensity of use, popularity (number of viewers)						
Viewer connection with the landscape						
Provision of vast, elevated panoramic views						
Sense of remoteness / tranquillity at the viewing location						
Degree of perceived naturalness						
Presence of striking or noteworthy features						
Sense of Historical, cultural and / or spiritual significance						
Rarity or uniqueness of the view						
Integrity of the landscape character within the view						
Sense of place at the viewing location						
Sense of awe						
<b>Overall sensitivity assessment</b>	<b>ML</b>	<b>L</b>	<b>ML</b>	<b>L</b>	<b>ML</b>	<b>ML</b>

**N** = Negligible; **L** = low sensitivity; **ML** = medium-low sensitivity **M** = medium sensitivity; **HM** = High-medium sensitivity; **H** = high sensitivity; **VH** = very high sensitivity

### 9.4.3.1 Magnitude of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a ‘photo-real’ depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing View;
2. Outline view (yellow outline showing the extent of the proposed development overlaid on the photograph);
3. Montage View Pre-mitigation (proposed Development prior to the establishment of mitigation); and,
4. Montage View with Mitigation Established.

VP No.	Existing and Baseline View (including the permitted Monvallet I and Monvallet II Solar Farms and associated infrastructure)	VP Sensitivity	Visual Impact Magnitude (Pre & Post Mitigation)	Pre-Mitigation Significance / Quality / Duration of Impact
VP1	<p><b>Local road north of Ballakelly Bridge –</b></p> <p>This is a gateway view from a slightly elevated section of local road just to the north of the R178 road corridor and the crossroads settlement of Ballakelly. The existing view is a richly textured view of predominantly rolling pastoral farmland and tillage interspersed with rural dwellings and electricity pylons / lines. There is a strong sense of openness due to the clipped hedgerows network but also some taller stands of trees.</p> <p>The baseline view, includes the infrastructure associated with the permitted Monvallet I and Monvallet II Solar Farms including the permitted substation in the nearest portion of the Monvallet I site</p>	Medium-low	<p>The proposed development results in a minor, barely legible adjustment to the baseline view, with the roof of the 2No. 110kV substations slightly taller than the consented but still barely visible, peeking above the surrounding vegetation. Despite this minor change, the substations building remains barely noticeable and unambiguous within the scene and is unlikely to be noticed by the casual viewer. At most, the design of the 2No. 110kV substations gives the impression of a rural dwelling. Therefore, the proposed development will have no impact on the visual amenity of this scene and the magnitude of visual impact is deemed Negligible.</p>	Imperceptible / Neutral / Long Term
VP2	<p>Cross roads settlement at Ballakelly Bridge - This is a view from a commercial garage / shop on the R178 at the confluence of three other local roads. There is also a cluster of dwellings making up this crossroads settlement. In the existing view, across the yard to the south is an area of rough grazing and scrub that soon gives way to rolling fields of pasture with little definition from hedgerows. A patch of mature vegetation in the foreground to the east screens views of the nearby Monvallet substation, but several high voltage overhead lines and associated pylon sets can be seen crossing the farmland towards this facility.</p>	Low	<p>The proposed substations are almost entirely screened by existing vegetation and landform from this location. Only the site fence and the tips of some taller, external electrical infrastructure have the potential to be visible from this location. In this instance, the proposed changes to the consented substation would result in a marginally reduced visual impact where a tall lattice structure is replaced in the view by smaller, narrow electrical rods/poles. While some electrical infrastructure is still visible, when viewed against the backdrop of existing overhead high voltage electrical infrastructure and the permitted Monvallett Solar Farm do not dominate the view. Once mitigation planting that forms part of the consented Monvallet I Solar Farm becomes established, only the tips of the taller</p>	Slight-imperceptible / Neutral / Long Term

	The baseline view contains a partial view of the consented solar arrays, which occupy a discrete section of the middle distance skyline ridge to the south where it is flanked by intervening pastoral fields on either side.		infrastructure will be visible. On balance, the magnitude of visual impact is therefore <b>Low</b> .	
<b>VP3</b>	<p>Cross roads settlement at Carrickadoon - This is a broad south-westerly view from a small cross roads settlement. Owing to the low-clipped nature of hedgerows throughout the fore-to-middle ground, the view is reasonably open and takes in fields of good quality pasture. In the existing view, lining the low middle distance ridge is a substantial country house surrounded by a stand of tall broadleaf trees, a large farm shed and then the existing Monvallet substation. The latter consists of a complex cluster of pylons gantries and masts and is contained at its northern end by a stand of tall conifers.</p> <p>In the baseline view, consented solar farms can be seen on the skyline ridge between and beyond the large farm sheds and the Monvallet substation described above.</p>	<b>Medium-low</b>	The proposed substation alteration is fully screened by existing vegetation, landform and infrastructure from this location, consequently the magnitude of impact is deemed <b>Negligible</b> .	<b>Imperceptible / Neutral / Long Term</b>
<b>VP4</b>	<p><b>Local road adjacent to Louth ESB substation</b> – The existing view is relatively open, looking across pastoral fields which have little definition in terms of hedgerows boundaries. Those hedgerows that do exist are tightly clipped. There are no houses in the immediate vicinity that take in the same view.</p> <p>In the baseline view, before mitigation planting is implemented, there is a direct and immediate view of the substation compound, consented as part of the Monvallet I Solar Farm. Once mitigation planting is established, as proposed by the consented Monvallet I</p>	<b>Low</b>	This view best illustrates the changes proposed to the scale and nature of the consented substation. This involves slight movement of the infrastructure to the north and removal of the tall, latticed electrical infrastructure. If anything, the visual impact is marginally reduced where taller infrastructure is removed. However, this is of little consequence because the proposed development will not be visible here once mitigation planting that forms part of the consented Monvallet I Solar Farm becomes established. The magnitude of visual impact is therefore <b>Negligible</b> .	<b>Imperceptible / Neutral / Long Term</b>

	Solar Farm, the site is entirely screened by vegetation.			
<b>VP5</b>	<p><b>Local road at Carnalughoge –</b></p> <p>The existing view depicts a broad vista afforded from a section of local road that runs north from the village of Louth and has a reasonable number of rural residences lining it, availing of countryside vistas to both the east and west. Several such residences can be seen framing the right hand side of the depicted view, which otherwise consists of gently rolling farmland. The skyline in the middle distance is occupied by the pylons of a high voltage overhead line.</p> <p>In the baseline view, sections of the consented Monvallet I solar array can be seen intermittently between intervening vegetation occupying a portion of the middle-distance ridgeline.</p>	<b>Medium-low</b>	The proposed 2No.110kV substations will not be visible here due its location behind the dwellings depicted in this view. The magnitude of visual impact is therefore Negligible by default.	<b>Imperceptible / Neutral / Long Term</b>
<b>VP6</b>	<p><b>Local road to the southeast of the site –</b></p> <p>This view is from the south-east of the site, with the existing view showing where the landscape ascends towards a low ridge that hosts a 110kV overhead line and associated pylons, which are a prominent feature of the view. The overhead line converges on Monvallet substation, which lies at the left hand side of the depicted view. The intervening landscape is contained in flat farmland. There is one notable dwelling and associated farm sheds located in the middle distance, to the left of the view.</p> <p>In the baseline view, sections of the consented Monvallet II solar array can be seen on the nearby rise to the northeast.</p>	<b>Medium-low</b>	The proposed 2No. 110kV substation will not be visible here as a result of screening afforded by the dwelling, related sheds and existing mature vegetation. The magnitude of visual impact is therefore Negligible by default.	<b>Imperceptible / Neutral / Long Term</b>

## **9.5 Cumulative Impacts**

On the basis that this application seeks an alteration to a consented substation and that the changes are deemed to result in no additional landscape or visual effects, there will be no material additional cumulative impacts either.

## **9.6 Assessment Conclusions**

The proposed alteration to the consented substation has been assessed in terms of landscape impacts and visual impacts against a baseline scenario that includes the consented substation. In this context there is very little consequence in terms of physical impacts to the site, the landscape character of the area and the visual impacts at surrounding receptors that will arise from the proposed alteration. Consequently, there is no material cumulative impacts either.

It is not considered that there will be any significant impacts arising from the proposed development.

## 10 CULTURAL HERITAGE

This chapter of the ER provides a description and an assessment of the potential, likely and significant impacts of the Proposed Development on archaeological, architectural and cultural heritage aspects.

The aim of this assessment is to evaluate the baseline cultural heritage environment at the Site and the likely adverse effects, if any, that the Proposed Development may have on the environment and to propose mitigation measures as may be necessary.

The assessment was prepared by Maurice F. Hurley (D.Litt, MA, FSA, MIAI), Consultant Archaeologist.

### 10.1 Introduction

The Site is located in the townlands of Toomes and Monvallet Co. Louth and covers an area of ca. 1.75ha. The Proposed Development will comprise of a 2No. 110kV substations and associated grid connection (refer to Appendix A), which will supersede 2x 37kV substations that were permitted under Phase 1 (PR 21/631). The assessment is based on a field inspection, cartographic and documentary research. Refer to Appendix A for Site layout.

The Site is located ca. 2.5km from the village of Louth between the main Dundalk to Carrickmacross Road (R178) and the L1143 local road. The Site is approximately equidistant from Dundalk, Co. Louth to the east and Carrickmacross, County Monaghan to the west. The Site is bounded by a minor road to the east where the Louth ESB Substation is located.

The landscape in this area is characterised by an undulating topography of drumlin hills whereon broad rectangular fields are maintained by a modern agricultural regime of pasture and tillage.

There are no Recorded Monuments within the Site boundary or within the immediate environs but a number of Recorded Monuments and one historic building stand in the wider vicinity of the Site.

### 10.2 Methodology

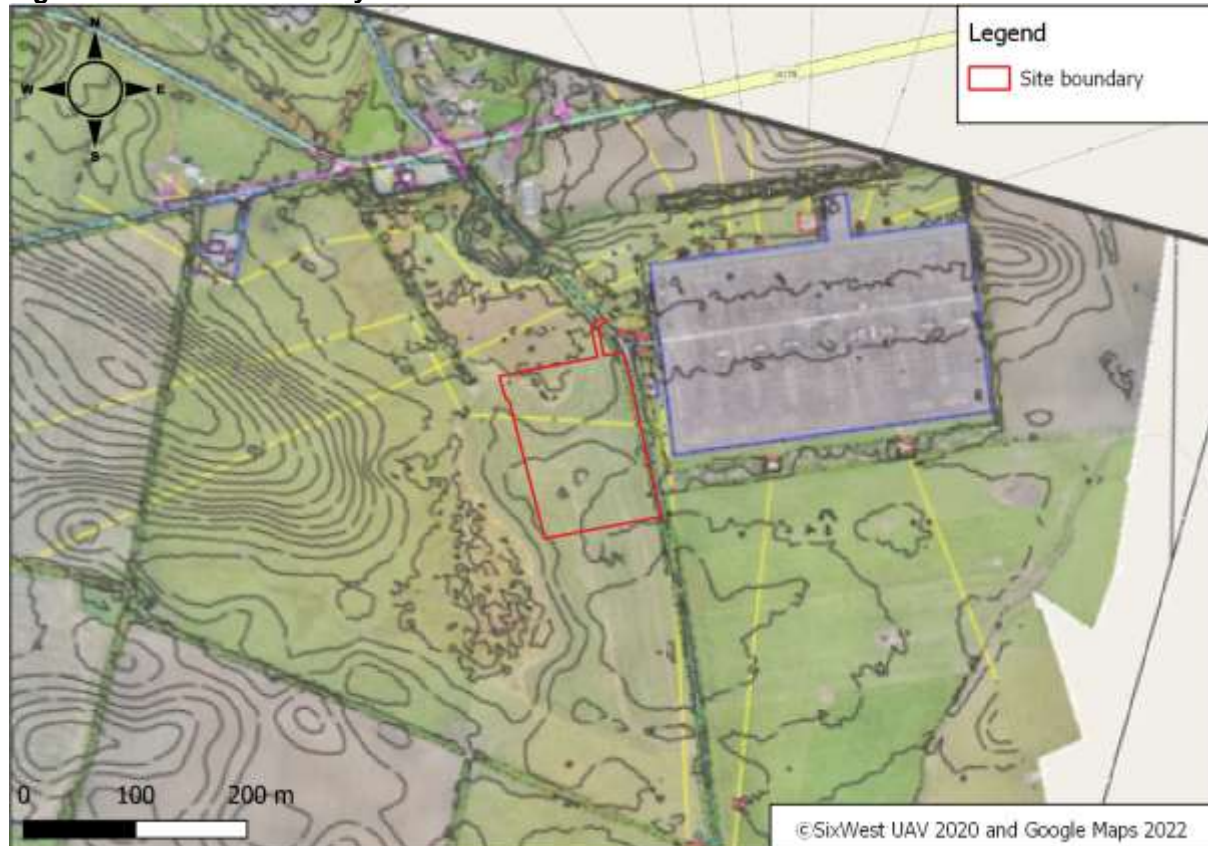
This study has been produced to assess the archaeological and cultural heritage resource of the Site in the context of the archaeological and historical environment of the area. The study was informed by Site inspection and was based on the results of documentary and cartographic research and an examination of available aerial photographs. Consulted sources include;

- All editions of the Ordnance Survey maps and aerial photographs;
- A topographical survey undertaken by drone;
- The Record of Monument and Places (RMP). These files are based on the pre-existing Sites & Monument Record (RMP) and information from completed county archaeological inventories. As such it records known upstanding archaeological monuments, their location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs;
- The topographical files of the National Museum of Ireland;
- Published and unpublished documentary sources for the area including unpublished field survey and references on archaeological testing and excavation in the vicinity; and,
- Field inspection, to assess the possibility of unrecorded archaeological sites being present within and adjacent to the Site.

### 10.3 The Receiving Environment

The Site is located in a largely flat agricultural field. Undulating topography of drumlin hills and is characterised by agricultural land in large rectangular fields in the wider vicinity of the Site (refer to Figure 10-1 and Plates 10-1 and 10-2). The layout of the fields in the vicinity of the Site was in existence before the mid-19<sup>th</sup> century (Figure 10-2), and the pattern has remained largely the same (Figure 10-3).

**Figure 10-1: Contour Survey of the Site**



The fields are subject to a modern agricultural regime with grassland predominating over tillage in recent years. The field fences are coppiced hedgerows with low drystone-built walls (Plate 10-3).

A farmyard and adjoining dwelling to the south of the Site are of twentieth century date and there are no buildings in this area that are shown on the first or second edition Ordnance Survey maps; the existing nearby dwelling house is a bungalow of ca. 1950's and the farm buildings are modern. No other buildings stand on or near the Site under review.

**Plate 10-1: The Site of the Phase 1 permitted development (PR21/631) looking south in the field opposite the Louth ESB Substation**



**Plate 10-2: The Site looking northeast. The hedgerow in the background is the eastern Site boundary flanking the roadside.**



**Plate 10-3: The hedgerows are characterised by old stone walls with coppiced hedges (in vicinity of the Site (PR21 / 631)).**



Historical maps illustrate the evolution of the landscape in this area. The Down Survey Map of 1656 depicts the southern part of Toomes townland as '*bogg*' with a small area of drier land '*Creglann*' marked in the centre. By the mid-nineteenth century the area under review was '*principally under tillage, producing abundant crops*' [80].

By the time the first edition map (1829-41) was compiled the area under review is divided into large fields under tillage, A number of structures are depicted along the road to Ballakelly Crossroads; and a Police Station is named. Along the southern end of the townland, an expanse of boggy ground is depicted. Within this boggy ground a rectangle containing a single building is shown and a tree-lined laneway leads westwards from the roadside to this enclosure/house. The laneway ca. 300m south of the Site and on the eastern side defines the area subject to Proposed Development. South of this laneway, the area shown as boggy ground is cut by a small field drain which forms the townland boundary between Toomes and

Drumgoolan. Two areas of boggy ground to the north and west of the Site are similarly depicted on the first edition Ordnance Survey map and these areas remain marginal agricultural land today (Figure 10-2, background).

The first and second editions Ordnance Survey map depicts large rectangular fields, (Figure 10-2 and 10-3) and the pattern remains relatively consistent today.

**Figure 10-2: First edition Ordnance Survey Map (1829-41)**



**Figure 10-3: Second edition: Ordnance Survey Map (1897-1913)**



### 10.3.1 General History of the Area

There are ca. 1600 listed monuments in the Recorded Monuments for Co. Louth. It is not an exhaustive list, as many other sites still remain to be uncovered. This gives an average of 1 monument per 5 hectares.

In the Archaeological Survey of Co. Louth by Buckley and Sweetman (1991) they set down two basic periods:

- The prehistoric and early Christian period up to 12th Century - Items of note during this time included: flint scatters, middens, isolated settlements, tombs, mounds, barrows and cairns, burials (cist and pit), enclosures, standing stones, rock art, Fulachta fiadh, crannogs, forts, souterrains, ringforts, earthworks and enclosures, field systems and toghers. Louth has a high concentration of souterrains.
- Medieval and post medieval period (12th Century onwards) - Including in the main, churches and monastic remains, cemeteries, other ecclesiastical remains, mottes, moated sites, castles, deserted medieval village, town defences, bridge, military fortifications and post medieval houses.

Most of Co. Louth once formed part of the 'Pale' which was a fortified area set up by the Anglo-Normans in the 15th Century to protect themselves from the native Irish. It was once referred to as the Land of Peace, occupied by obedient shires. There are no remains of this fortification in Louth today.

The earliest known archaeological sites in the area under review date to the Early Bronze Age, but settlement from earlier periods cannot be ruled out.

A barrow (burial mound/enclosure), defined by a bowl barrow (RMP LH011-0101) is located ca. 1.1km to the west of the Site boundary in the townland of Oaktate. The site was excavated

in 1926 (Morris 1926, 71), and was described then as being made up of piled stones, mixed with earth and numerous fragments of bone. A rectangular cist aligned NW-SE containing four urns (RMP LH011-0102) was found in the centre of the mound. Cist graves and urn burials are rarely found on the hills and mountains and tend to occur at lower altitudes, especially, but not exclusively in sand and gravel moraines. Such burials are common throughout Country Louth as they are especially common in the east of Ireland.

Other characteristic monuments from the Bronze Age include rock art, fulachta fiadha and possibly standing stones. A dense concentration of rock art site occurs at Drumirill, Co. Monaghan at a distance of ca. 1.5km to the north of the Site. The rock art at Drumirill accounts for over half of known rock art in the County Louth and Monaghan region. In 2003 Dr. Blaze O' Connor carried out an excavation Drumirill that revealed a complex series of activity at the site. Finds included early Neolithic pottery and a flint round scraper; these finds alert us to the possibility of more widespread Neolithic activity in the wider region and the survival of a dense concentration of prehistoric monuments in a rocky hill may relate largely to restrictions to historical agricultural activity in that particular landscape. The excavation also revealed metallic material, comparable to Bronze Age metallurgical waste. Standing stones occur throughout the county, the nearest to the Site under review being located in the townland of Monavallet (LH011-005) standing on a low ridge at a distance of ca. 970m to the east of the Site.

Possible pressure on the population throughout the Bronze Age appear to have resulted in the construction of ringforts. Ringforts are the most commonly represented settlement type with a strong surface expression identifiable in the Irish archaeological record. An average ringfort consists of a circular, oval, D-shaped or sub-circular area enclosed by one or more banks of earth, stones, drystone walls or a combination of earth and stones. They are generally regarded as enclosed homesteads that afforded their inhabitants and their livestock protection from cattle-raiders and wild animals. Ringforts are variously referred to by the Gaelic names rath, lios or dun. Density of ringfort is relatively sparse in this area when compared with the rest of Leinster. Two possible enclosures which may represent ringforts; LH011-133 in the townland of Carnalogue and LH011-034 in the townland of Tullycahon are located to the southeast of the Site at distances of ca. 428m and ca. 1.2km respectively; both were identified as cropmarks on aerial photographs and neither has surface visibility today. Souterrains; artificial underground chambers are often associated with ringforts or early ecclesiastical sites. Several souterrains occur in proximity to the Site, the closest (LH011-006) in the townland of Carnalogue lies at a distance of ca. 842m to the southeast of the Site and according to local tradition is associated with a 'cave' in a ringfort in this townland [81]. A second souterrain is located in Monavallet townland, ca. 857m from the Site under review and is not associated with either a ringfort or an ecclesiastical site and therefore may have been associated with an unenclosed settlement.

The Early Medieval period is characterised by the foundation of a large number of ecclesiastical sites throughout Ireland in the centuries following the introduction of Christianity in the fifth century AD. The early churches tended to be constructed of wood or post-and-wattle. Between the late eight and tenth centuries mortared stone churches gradually replaced the earlier buildings. Many of the sites, some of which were monastic foundations, were probably originally defined by an enclosing wall or bank similar to that found at coeval secular sites. This enclosing feature was probably built more to define the sacred character of the area of the church than as a defence against aggression. An inner and outer enclosure can be seen at some of the more important sites; the inner enclosure surrounding the sacred area of church and burial ground and the outer enclosure providing a boundary around living quarters and craft areas.

The nearest extant substantial farmhouse is Monavallet House standing at a distance of ca. 857m from the eastern Site boundary. This house is recorded in the *National Inventory of*

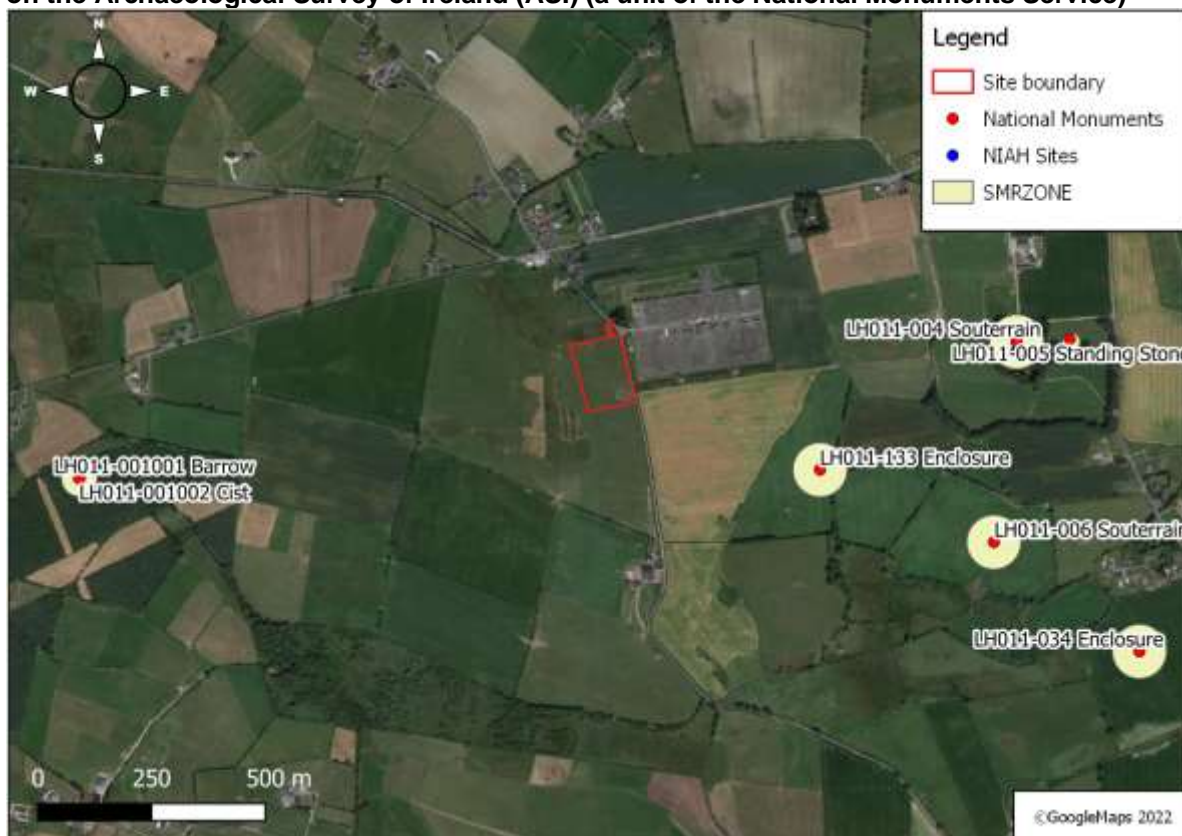
*Architecture* (Ref: 13901105). The house was built by Robert McArdle in 1872 and is described as a good example of the Italianate villa style architecture which was popular for country houses at the time.

### 10.3.2 Archaeological of the Site and Surrounding Area

There are no known Recorded Monuments within the Site but there are a number in the wider environs (Figure 10-4).

The nearest known monuments are listed in the tables below with a brief description. The RMP number, monument classification, townland name and approximate distance from the Site is presented below. The locations of the monuments are shown on Figure 10-4.

**Figure 10-4: Location of archaeological monument and buildings in the vicinity as presented on the Archaeological Survey of Ireland (ASI) (a unit of the National Monuments Service)**



<b>Reference Number</b>	<b>LH011-133</b>
<b>Monument Type</b>	Enclosure
<b>Description</b>	Description: Aerial photograph (GB90.BZ.27) shows cropmark of a rectilinear enclosure defined by a fosse. It is plough-levelled. First recorded as a positive cropmark in July 1990.
<b>Townland</b>	Carnalughoe
<b>County</b>	Louth
<b>Distance to Site boundary</b>	ca. 428m

<b>Reference Number</b>	<b>LH011-006</b>
Monument Type	Souterrain
Description	Description: Local tradition of a 'cave' in a ringfort in this townland.
Townland	Carnalughoe
County	Louth
Distance to Site boundary	ca. 842m

<b>Reference Number</b>	<b>LH011-004</b>
Monument Type	Souterrain
Description	Local tradition of a drystone passage at the rear of an outbuilding at Monvallet.
Townland	Monvallet
County	Louth
Distance to Site boundary	ca. 857m

<b>Reference Number</b>	<b>LH011-005</b>
Monument Type	Standing stone
Description	Situated on top of a low ridge. The stone, now in a recumbent position (max. dims. L 3.1m, 1.7m by 0.9m in section), is composed of a flaky shale and appears to have had one end chamfered to fit into a pit in the ground. It was re-erected in 2016. (CLAJ 1910, 296; 1962, 165)
Townland	Monvallet
County	Louth
Distance to Site boundary	ca. 970m

<b>Reference Number</b>	<b>LH011-001002</b>
Monument Type	Cist
Description	Short cist, rectangular in plan (L 0.74m, With 0.25m, D 0.23m), aligned NW-SE, discovered 0.76m below the surface of barrow LH011-001001-. The interior contained two Vases and sherds of two Vase Urns. (CLAJ 1926, 72-4; JRSAI 1970, 123)

Townland	Oaktate
County	Louth
Distance to Site boundary	ca. 1.1km

<b>Reference Number</b>	<b>LH011-001001</b>
Monument Type	Barrow
Description	Situated on slight rise in undulating, outcropping countryside. Circular bowl-barrow (diam. 14.6m, H 0.9m). Excavation by H. Morris in 1926 (CLAJ 1926, 71-6) revealed that the site was comprised of piled stone mixed with earth and numerous fragments of bone. A rectangular cist, aligned NW-SE, almost at the centre of the mound contained four 'urns'
Townland	Oaktate
County	Louth
Distance to Site boundary	ca. 1.1km

<b>Reference Number</b>	<b>LH011-034</b>
Monument Type	Enclosure
Description	Cropmark indicating oval enclosure (max. dims. ca. 54m NW-SE, ca. 43m NE-SW) on aerial photograph (CUCAP, ALU 19).
Townland	Tullycahan
County	Louth
Distance to Site boundary	ca. 1.2km

### 10.3.3 Buildings & Structures of Architectural Merit

There are no features of architectural merit listed in the *National Inventory of Architecture Heritage* (NIAH) within the Site boundary [82]. The nearest NIAH is Monvallet House which is located ca. 857m from the eastern Site boundary. This house is recorded in the *National Inventory of Architecture* (Ref: 13901105).

### 10.4 Potential Impacts

Proposals such as the development of a substation can have both *direct* and *indirect* impacts on the archaeological heritage of the Site and area. Direct impacts tend to be mainly physical impacts resulting from the construction process and indirect impacts tend to be mainly visual. Direct impacts on the archaeological heritage are permanent as archaeology is a non-renewable resource. Visual impacts are confined to the life of the development and are therefore reversible in the longer term.

### **10.4.1 Direct Impact**

The Site access will be from Phase 1 permitted development (PR 21/631). The Proposed Development will be located in a strip of land flanking the western side of this road, opposite the operational Louth Substation. An underground cable beneath the road surface is proposed to connect the new substations to the existing Louth ESB Substation on the opposite side of the road.

The largest likely impacts on the existing ground surface will be from the construction of building units namely; the two substations and perimeter security fence (see Appendix A).

The machinery utilised in the course of the works will be; a 13-tonne digger, 6 tonne piling rig with tracks of 600mm to minimise ground disturbance or alternatively a tractor mounted piling rig will be used. These machines are no heavier than those used in modern agricultural practices.

### **10.4.2 Indirect Impacts**

Indirect Impacts tend to be mainly visual. There will be no indirect impact on any known archaeological monument or feature, either physically or visually. All identifiable monuments in the immediate vicinity of the Site are at considerable distances from the Site boundary, therefore no indirect impacts on the known archaeological resource of the area are likely to arise. Some of the sites are also identifiable only from aerial photographs e.g., LH011-133 and LH011-034; both enclosures and therefore issues of visual impact on the monuments do not arise.

Visual impacts on known archaeological monuments in the wider vicinity of the proposal under review are unlikely to be significant as the distance to other monuments in the wider vicinity also serves to reduce issues of potential visual impacts.

## **10.5 Proposed Mitigation Measures**

Inadvertent impact on hitherto unknown buried archaeological material can be mitigated by archaeological monitoring of any significant areas of ground disturbance, in particular the soil removal for the access track, all the proposed buildings, and the cable trench. Such a requirement for monitoring may form a condition of any grant of planning permission.

### **10.6 Cumulative Impact**

The Proposed Development will be superseding the permitted 2 x 37kV substations granted as part of PR 21/631. The Phase 1 permitted development PR 21/631 does not contain any archaeological monuments. The Phase 2 permitted development PR 21/1478 contains two archaeological monuments, but neither of these have surface expression and their locations have been protected by the design of the proposal. The Phase 3 permitted development (PR 22/534) has been designed to safeguard all the known monuments and therefore issues of visual and physical impact do not arise. Extensive geophysical surveys concluded the location of these protected structures. Therefore, there is no cumulative impact from this proposal on the archaeological resource or cultural heritage of the area.

## **10.7 Assessment Conclusions and Recommendations**

There are no archaeological monuments within the boundary of the Site. The main elements requiring mitigation involve avoiding direct impact on any potential buried material of archaeological significance and this is best achieved by archaeological monitoring of areas of significant ground disturbance such as parts of the access tracks and substation construction. Therefore, significant ground disturbances should be subject to monitoring by a suitably qualified archaeologist in accordance with national guidelines [83].

## 11 MATERIAL ASSETS – TRAFFIC

In advance of construction commencing the appointed contractor will use the commitments outlined in this chapter to prepare a separate Construction Traffic Management Plan (CTMP). The CTMP will be termed a “Living Document”, such that any changes to the construction programme, operations or unforeseen issues will be incorporated into the CTMP throughout the project as deemed necessary by the contractor or relevant authorities.

It is proposed that there will be a single construction programme for the Permitted Developments and the Proposed Development.

### 11.1 Road Network

#### 11.1.1 Existing Road Network

The existing road network in the vicinity of the Site is presented in Figure 11-1 and described in the following text:

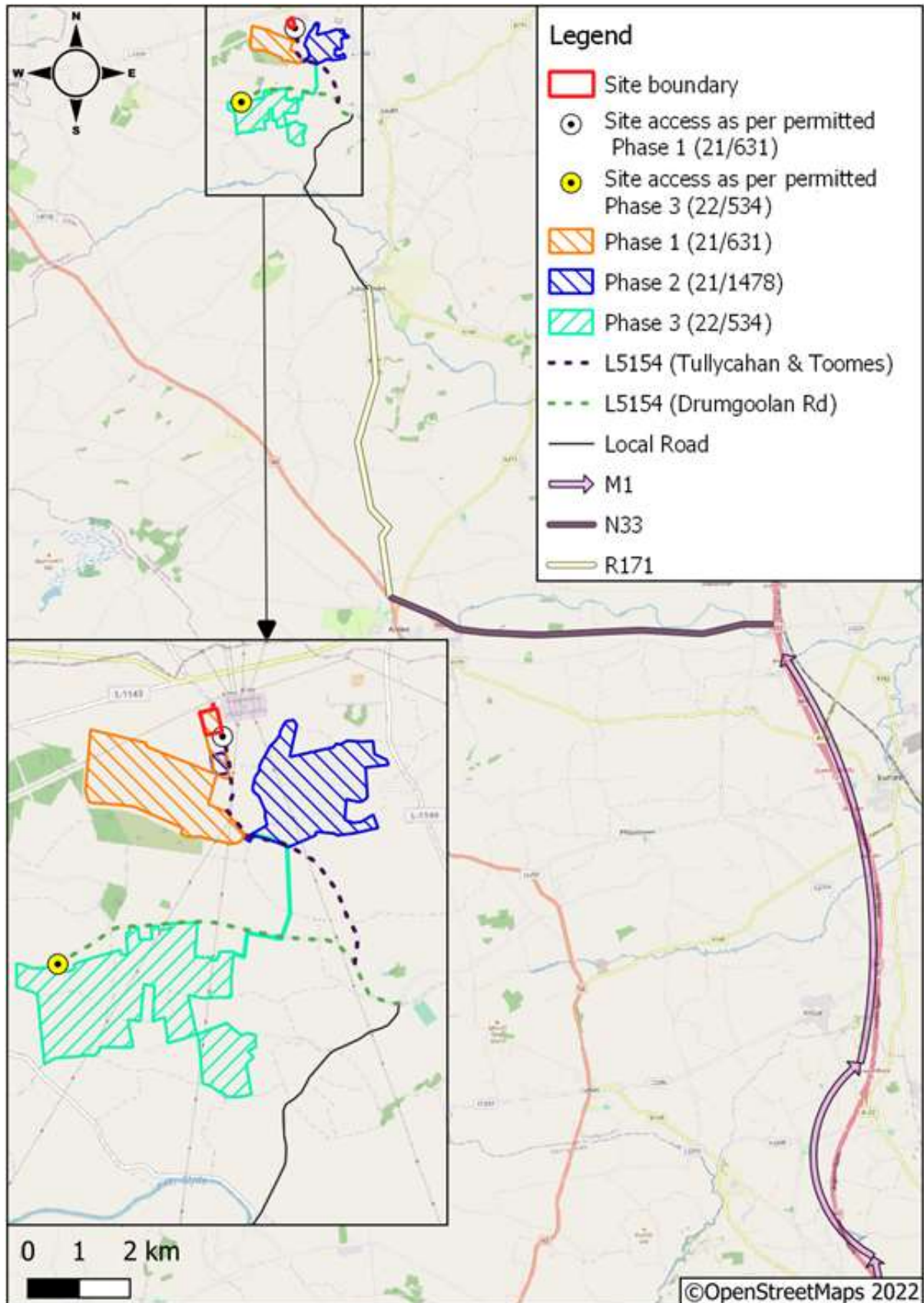
**M1:** The M1 is a motorway which runs continuously from Dublin to Belfast. The motorway is a separated 2+2 dual carriageway road, with a 2m wide hard shoulder running in each direction and a top speed limit of 120km/h.

**N33 (Ardee Link Road):** The N33 road is a national primary road. It provides a link road in County Louth between the N2 Dublin-Derry, M1 Dublin-Belfast and Ardee-Dunleer routes.

**R171:** The R171 road is a regional road linking Ardee and Dundalk. The road is mainly a wide single carriageway with two lanes throughout.

**Locals Roads:** At Tallanstown, the R171 splits to the right. Continuing straight, the route follows unnamed local roads and the L5141 local road towards the R178, to the north of the Site. The unnamed local roads and the L5141 (Tullycahan & Toomes) are typical rural roads, approximately 5m wide.

Figure 11-1: Existing Road Network



### 11.1.2 Future Road Network

There are currently no proposed road network improvements in the vicinity of the Proposed Development.

### 11.1.3 Collisions

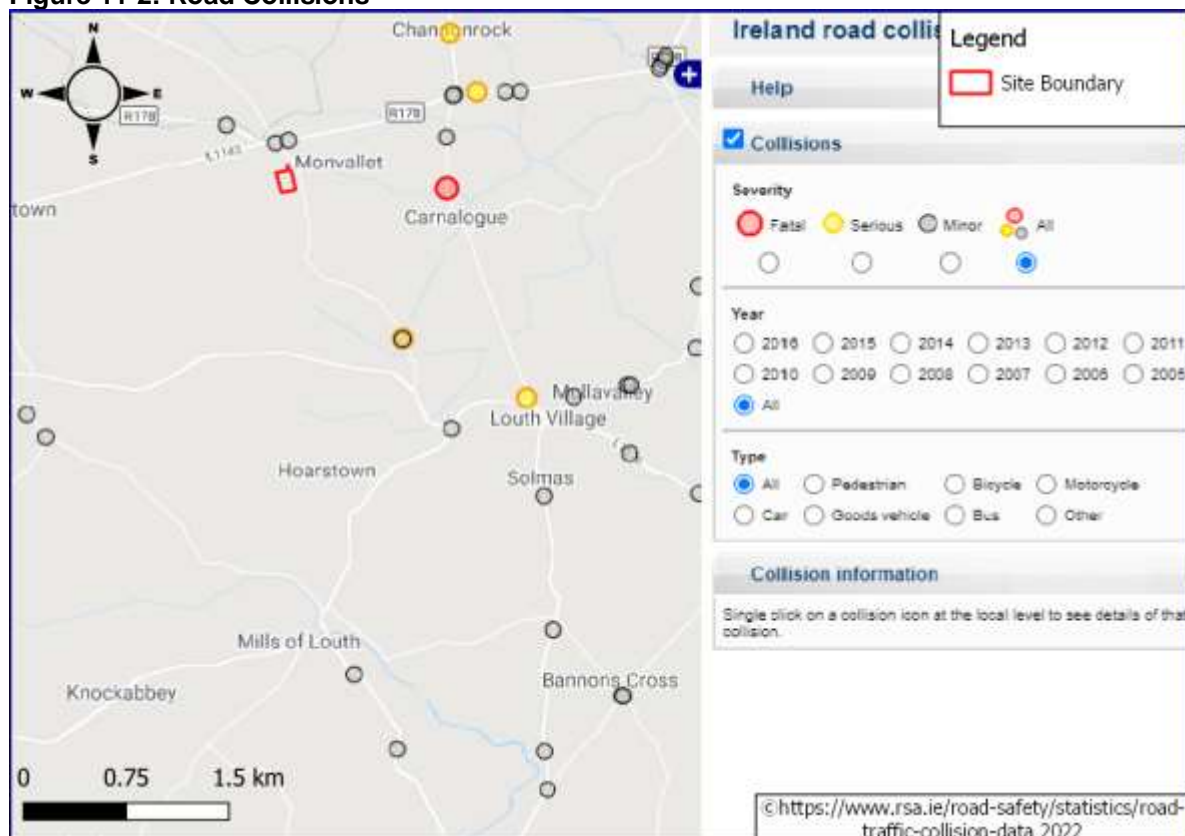
Information on road collisions was sourced from the Road Safety Authority website [84]. Figure 11-2 below shows the recorded collisions on the road network in the area for the period 2005 to 2016 inclusive (no later collision data is available).

Two minor accidents occurred on the R178, ca. 250m north of the Site, one in 2007 and one in 2008.

One minor collision and one serious collision involving a bicycle have occurred on the L5141 within 2km of the Site, the most recent being in 2013.

One fatal collision occurred with a vehicle and pedestrian in 2014 ca. 100m northeast of the Site along the L1140. A minor collision further up the L1140 occurred in 2009, ca. 500m north of the Site.

Figure 11-2: Road Collisions



The road collision data outlined above was gathered in early 2022. Please note that the RSA collisions section of the website is currently 'in the process of reviewing our road traffic collision (RTC) data sharing policies and procedures. Record-level RTC data can't be shared until this review is complete'. [84]

### 11.1.4 Traffic Generation

The existing Site is in agricultural use and therefore generates little traffic.

## 11.2 Site Access and Egress

The Proposed Development will be accessed via an access that was authorised as part of the Phase 1 permitted development PR 21/631 (refer to Section 5.3).

Both construction and operational phase access will be via the existing farm access off the L5141.

The L5141 runs north to south and is, on average, 5m wide. The speed limit on this local road is 80km/h. The L5141 provides adequate stopping site distance and satisfies current standards. This site access is also in accordance with all sightline visibility requirements, as set out by Louth County Council, of 75m for a rural road with an 80km/h speed limit, measured from a 3m set-back from the road edge. The sightlines to the proposed access will be in excess of the stipulated 75m and therefore no improvements will be required.

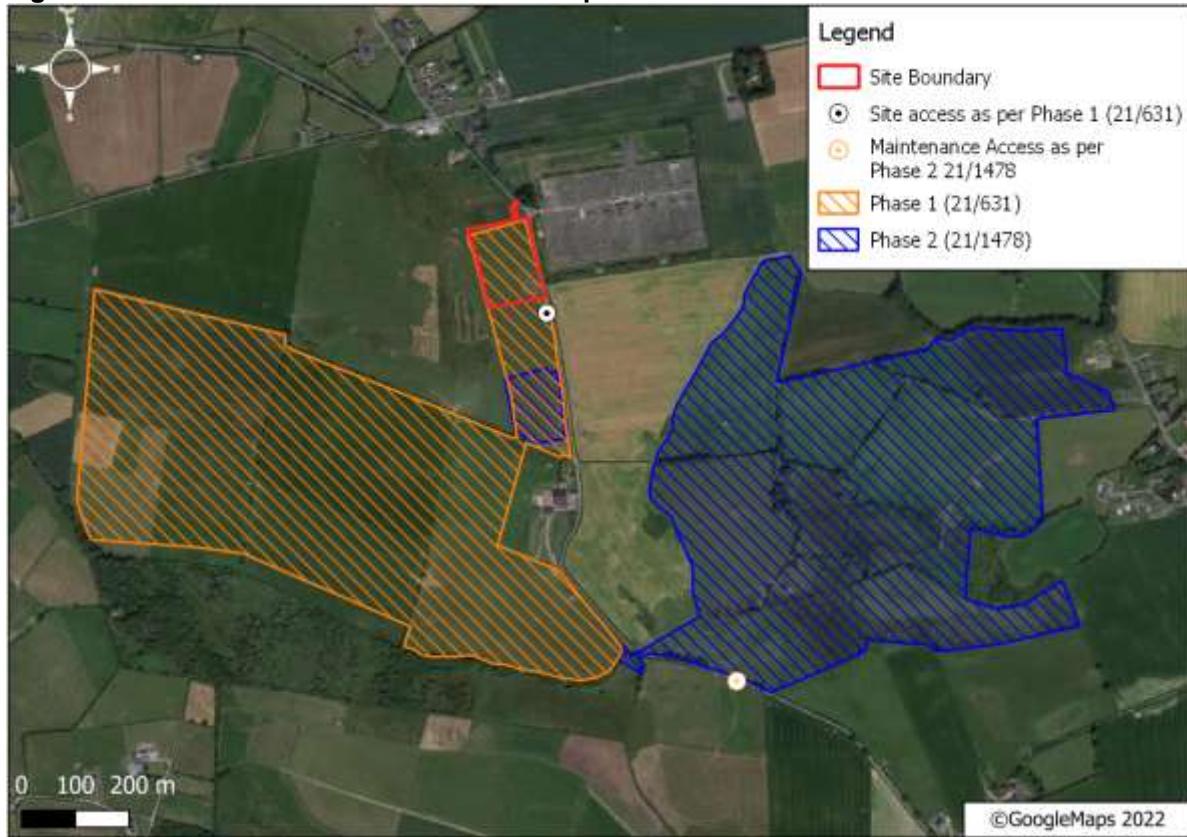
### Main Site Access - Permitted Developments (PR 21/631 & PR 21/1478)

The Permitted Developments will use the access that was granted under the permitted development PR 21/631. Both construction phase and operational phase access will be via the existing farm access off the L5141 (see Figure 11-3). Access around the Site will be via existing access tracks into the Site and around the perimeter.

### Operational Maintenance Access - Permitted Developments (PR 21/631 & PR 21/1478)

Access required for the maintenance of the battery storage extension will be via the permitted main site access (See Figure 11-3 below). A maintenance access point will be constructed along the south-western boundary of permitted development PR 21/1478. This access will only be used during the operational phase of the Permitted Developments for ongoing maintenance purposes. There will be minimal visits each year, hence this access will be used very infrequently. This proposed new maintenance access has been designed in accordance with all sightline visibility requirements, as set out by Louth County Council and was permitted under PR 21/1478.

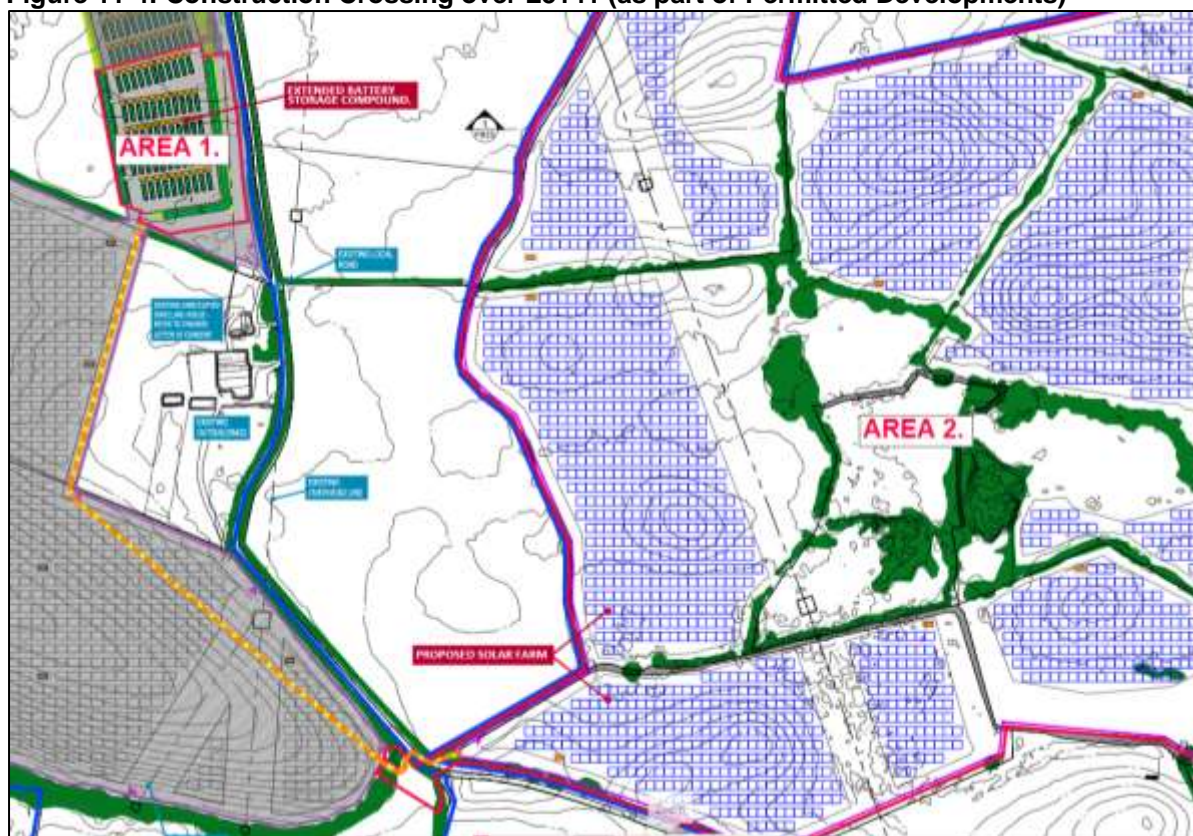
Figure 11-3: Site Access for Permitted Developments



### Temporary Construction / Decommissioning Crossings - Permitted Developments (PR 21/631 & PR 21/1478)

A permitted temporary crossing point will be installed across the L5141 to facilitate construction traffic during the construction phase. This crossing was permitted under PR 21/1478 and will be located at the south-eastern corner of permitted development PR 21/631 to provide access into the south-western corner of permitted development PR 21/1478. An existing field entrance on the south site of the L5141 will be upgraded to facilitate a temporary construction and a new temporary access will be constructed directly opposite on the L5141, that will be immediately decommissioned upon completion of the construction works with a new hedgerow that will be planted at this location (see Figure 11-4). The above improvements have been proposed and permitted in accordance with guidance from Louth County Council.

**Figure 11-4: Construction Crossing over L5141 (as part of Permitted Developments)**



### **11.3 Construction Traffic**

Construction traffic for the Proposed Development will travel from Dublin Port via the M50, along the M1 towards Belfast for ca. 64km. At Junction 14, all vehicles will take the N33 Exit towards N2/Ardee/Derry and follow for ca. 8km. At the Carrickmacross Rd roundabout, all vehicles will take the third exit towards the R171. All vehicles will travel ca.12km along local roads before they reach the L5154. After traveling ca. 400m north, trucks will come to a Y-junction in the local road. Vehicles from here will either follow dedicated routes to either the Proposed Development and the Phase 1 and Phase 2 developments in construction compound (A) or the Phase 3 construction compound B (see Figure 11-5).

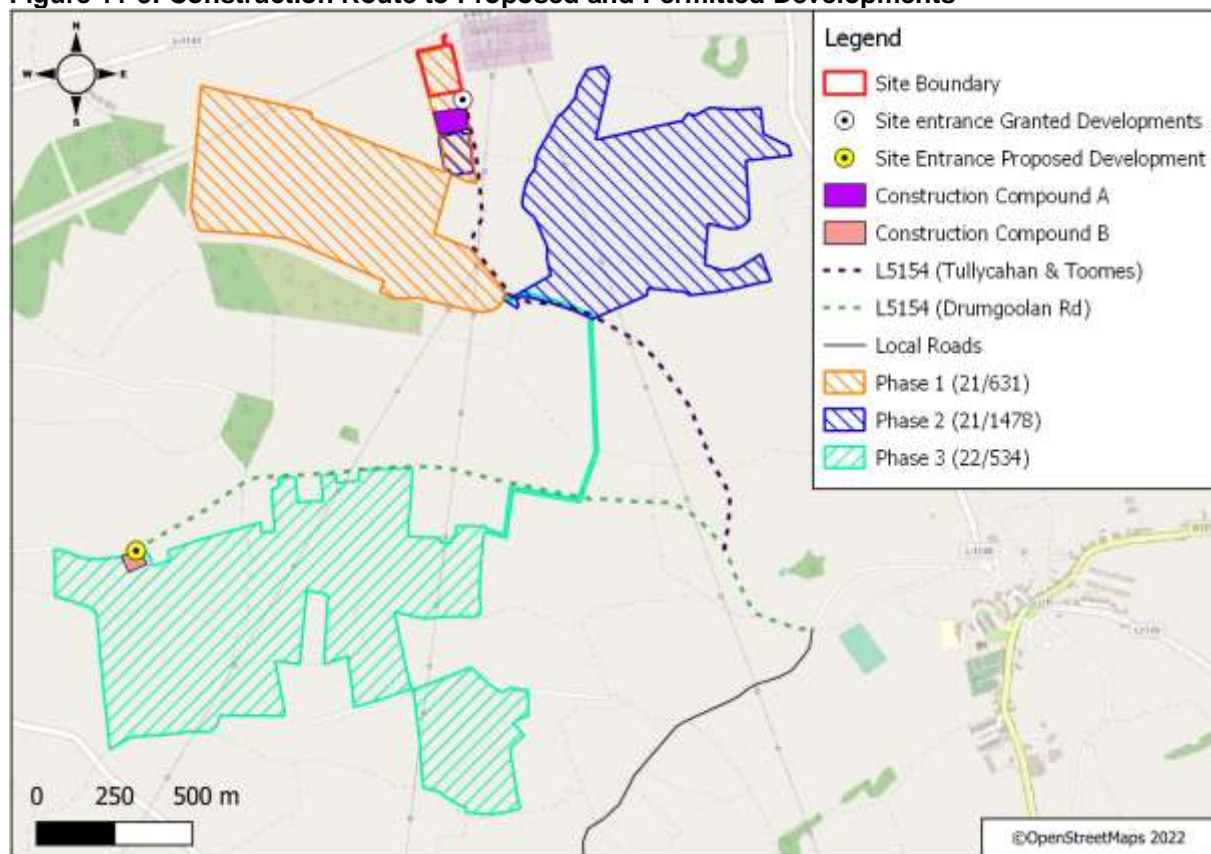
These routes have been carefully selected to maximise the use of the National Road network and to avoid urban centres. All truck drivers will be notified of this route in advance of commencement of their journey. The main contractor will strictly enforce the traffic management plan to ensure that all construction vehicles will follow the dedicated routes to

construction compounds A or B. Deliveries to the Site will be carefully coordinated to minimise the risk of arriving and departing trucks meeting on the L5141 or any local roads.

All construction phase materials will be delivered to the Proposed Development and Permitted Developments via the L5141 and will be stored in a temporary construction compounds, situated close to the Site access. Materials will be transported around the Site via existing access tracks.

It is proposed that temporary signage would be used to highlight the two separate entrances to the Proposed Development and Permitted Developments and the Phase 3 permitted development so it is clear to HGV drivers which route they should follow from the local and regional roads. Temporary signage would also be used to prohibit parking of delivery vehicles on the local roads.

**Figure 11-5: Construction Route to Proposed and Permitted Developments**



### 11.3.1 Construction Route A to Proposed Development (and Permitted Developments)

All heavy goods vehicles (HGVs) delivering to the Proposed Development and Permitted Developments will follow signage to Construction Compound A and will stay straight onto the L5141 for ca. 1.8km before reaching the permitted access entrance on the left.

### 11.3.2 Construction Route B to Final Phase

All HGVs delivering to the permitted Final Phase (PR 22/534) will follow signage to Construction Compound B, will take a left onto the L5141 and travel for ca. 2km before reaching the Site entrance on the left. It is proposed that all construction vehicles arriving to and departing from the Site will follow a dedicated route – See Figures 11-1 and 11-5.

### **11.3.3 Construction Traffic**

As part of the Proposed Development, temporary trenching of the L5141 road will be completed in order to facilitate the underground grid connection. This trenching is anticipated to last for approximately 1-day at the end of the construction period. Due to the nature and scale of the activities anticipated, the effects on traffic will be brief and therefore not significant.

### **11.3.4 Traffic Management Signage**

Throughout all construction works, road warning signage indicating traffic movements associated with the development will be erected. Temporary signage will be used to highlight the entrance to the Site and to direct construction traffic to the Site from the national and regional roads.

Temporary signage will also be used to prohibit parking of delivery vehicles on the L5141 road. The signage will direct drivers to the construction compound within the Site. All signage will be in accordance with the Department of Transport's Traffic Signs Manual, Chapter 8 – Temporary Traffic Measures and Signs for Roadworks and will be installed prior to works commencing onsite.

The proposed underground electrical cable route will cross the existing local road to the northeast of the Site. To ensure safe passage of public traffic at this location, trained flagmen will be assigned to control such movements in a safe manner. Flagmen must wear high visibility vests and use approved Stop/Go signs. The flagmen must be in visible contact and in voice communication with each other at all times.

The construction compound area will allow loading and unloading of all construction vehicles and will provide a turning area for vehicles to exit the Site. Adequate signage will be erected where required.

### **11.4 Operational Traffic**

As previously mentioned, the operational access for the Proposed Development will be via the permitted L5141 access.

The Proposed Development will require approximately 1No. maintenance visit per year, though the system operator could have a technician onsite more frequently to undertake routine, non-intrusive maintenance tasks such as Site inspection, cable and power plant checks and servicing, hedgerow maintenance etc. Only small vans / jeeps will be used to access the Site.

The traffic generation during the operational stage will therefore be negligible.

### **11.5 Construction Programme**

Due to the fact that the Proposed Development will be constructed in tandem with the Permitted Developments, the construction programme, indicative phasing and construction details have been prepared on the basis of one construction project.

A typical construction timeline for a 240,657no panel solar farm, 102no. battery storage containers and onsite substations are outlined in Table 11-1 below. This is an indicative Construction Programme with corresponding construction related traffic. The entire construction, including mobilisation of the solar farm and battery storage facility is anticipated to last for approximately 14 months.

The heavy construction traffic will be broadly spread evenly over the majority of the construction programme, namely between weeks 10 – 45. Outside of this period, traffic will mostly be limited to light traffic from workers commuting to and from the Site. The

construction programme is further broken down into 4 phases, which are described in Table 11-2 along with anticipated vehicle movements.

The bulk of the heavy construction traffic is based around the delivery of materials to the Site, which is concentrated in a period of 35 weeks at the beginning of construction (weeks 10-45). Outside of this period, traffic is mostly limited to light traffic from workers commuting to and from the Site.

**Table 11-1: Indicative Construction Programme (14 months)**

Task Name	Weeks											
	1-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
<b>Mobilisation Period</b>												
Notice to proceed												
Detailed Design												
Health & Safety Document												
Equipment Lead time												
<b>Construction Phase</b>												
Phase 1												
Phase 2												
Phase 3												
Phase 4												
Testing & Commissioning												

The construction programme is further broken down into four phases, which are described in Table 11-2 along with anticipated vehicle movements.

**Table 11-2: Indicative Construction Phases Details**

Phase	Phase Description	Timeline (Wks)	Processes	Vehicle Movements
1	Site Setup and Laying Foundations	0 - 15	This Phase involves: <ul style="list-style-type: none"> <li>Set up site and access roads, excavation of the ground, laying for concrete foundations, perimeter fencing and security.</li> <li>Site Welfare and construction worker parking set-up.</li> </ul>	Ca. 5-10 lorry movements per day.
2	Installation of Solar Panel Frames and Battery Storage Units	15 - 40	This Phase involves: <ul style="list-style-type: none"> <li>Installing piles, setting-out of the frame and inverter positions;</li> <li>Constructing of the solar panel frames;</li> </ul>	Maximum of 10 - 19 deliveries per day with the majority of these movements made up of the delivery of the solar panel frames and battery storage containers.

Phase	Phase Description	Timeline (Wks)	Processes	Vehicle Movements
			<ul style="list-style-type: none"> <li>• Installation of solar panels onto frames;</li> <li>• Installation and securing of container units;</li> <li>• Installing battery arrays into the container units;</li> <li>• Installation of transformers and cabling; and,</li> <li>• Opening and reinstatement of service trenches.</li> </ul>	
3	Installation of Cabling and Ducting	35-50	<p>This Phase involves:</p> <ul style="list-style-type: none"> <li>• Installation of AC cables, DC mains, earthing system and ducts; and,</li> <li>• Installation of MV and LV AC cables, the DC submains and mains, comms and security ducts, earthing systems, inverters and MV subs.</li> </ul>	Maximum of 5-12 deliveries per day.
4	Connections and Commissioning	50-60	<p>This Phase involves:</p> <ul style="list-style-type: none"> <li>• Connecting Electrical connections (LV DC &amp; AC), installing modules and overall Site commissioning; and,</li> <li>• Testing &amp; Commissioning.</li> </ul>	Maximum of 5 deliveries per day.

### 11.5.1 Construction Deliveries

The construction delivery generation for the overall development has been informed through discussion with the Applicant and is based on experience of constructing similar developments.

The construction period is estimated to last for up to 14 months, with deliveries fluctuating within this period. The main deliveries to the construction compounds (A&B) will be the solar panels, their frames and supports including piles, materials substation, materials for battery storage units and other associated infrastructure.

Solar panels, frames, and all ancillary components such as switchgear and inverter panels will be housed in units and will be easily transported to the Site using HGVs.

The battery storage units going to construction compound A will be prefabricated offsite in order to reduce the number HGV trips to the Site. Ancillary components such as switchgear and transformers will be transported to the Site using HGVs. In addition, there will be battery arrays, step up transformers as well as other electrical and mechanical equipment. Materials for the 2No. 110kV substation will be brought onsite to construction compound A as well.

Given the size of the overall development, it is not intended to remove a significant amount of materials from the Site. All surplus excavated materials arising from development works will be reused onsite for landscaping works, thereby minimising the potential for traffic generation. Any necessary exceptions to this will be collected and stored in suitable receptacles before they are taken offsite and transported to a suitably licensed waste facility

in strict accordance with all requirements of the Waste Management Act and subsequent regulations.

It is expected that there will be approx. 240,657no. individual photovoltaic panels for the Permitted Developments. In addition, there will be inverters, transformers and cabling, as well as other electrical and mechanical equipment.

During the installation works of the solar panels, it is not intended to remove material from the Site as the existing ground will generally remain undisturbed. The only arisings will be those from the foundations of fencing and buildings and they will be re-used onsite where required.

The total number of HGV deliveries has been estimated to be ca. 2,100 and the weekly and daily distribution of those deliveries over the 14 months construction period is presented on Table 11-3 below.

**Table 11-3: Indicative deliveries over the 14 month construction period**

Weeks	HGV deliveries	Weekly HGV Deliveries	Maximum Daily HGV deliveries (6 Days)
1-5	0	0	0
5-10	100	20	4
10-15	250	45	10
15-20	300	55	12
20-25	400	70	15
25-30	400	70	15
30-35	250	45	10
35-40	200	35	8
40-45	150	30	5
45-50	150	30	5
50-55	50	10	3
55-60	0	0	0
<b>Total</b>	<b>2,100</b>	<b>410</b>	<b>87</b>

The median weekly delivery rate equates to 40 deliveries (40 inbound /40 outbound movements) between weeks 5-55, with a single peak of 70 deliveries (70 inbound / 70 outbound movements) during weeks 20-30.

It is envisaged that the majority of movements would be Monday to Friday with only a limited number of movements on a Saturday. Adopting these figures, the average daily trip rate would be approximately 7 deliveries (7 inbound / 7 outbound movements) per day over the entire 55 weeks (weeks 5-55), with 15 deliveries (15 inbound / 15 outbound movements) per day throughout the peak weeks of 20-30.

The Site Manager will be responsible for managing the arrival of deliveries in order to ensure that they will be evenly split over the day to minimise potential traffic disruption on the surrounding road network. It is predicted that delivery vehicles will attend the Site for approximately 1 hour per vehicle. There will be more than sufficient space within the construction compound area and the Site generally to ensure that no delivery vehicles will have to wait on the surrounding road network.

### 11.5.2 Construction Staff

During construction, taking into consideration the normal intensity of onsite activity and the duration of the programme, it is expected that the construction schedule is likely to require no more than 90 staff to be onsite for both the Overall Development at any one time. Staff are anticipated to arrive at the Site in the 30-minute period preceding the start of the operating

day (i.e. 06:30 to 07:00hrs) and depart in the 30-minute period following the end of the operating day (i.e. 19:00 to 19:30hrs). Staff are likely to travel from different origins and hence distribute their impact across the roadway network.

It is expected that teams of specialist operatives will arrive together in shared transport and that other general operatives will arrive in single occupant cars. It is assumed that no operatives will arrive by walking, cycling or use of public transport.

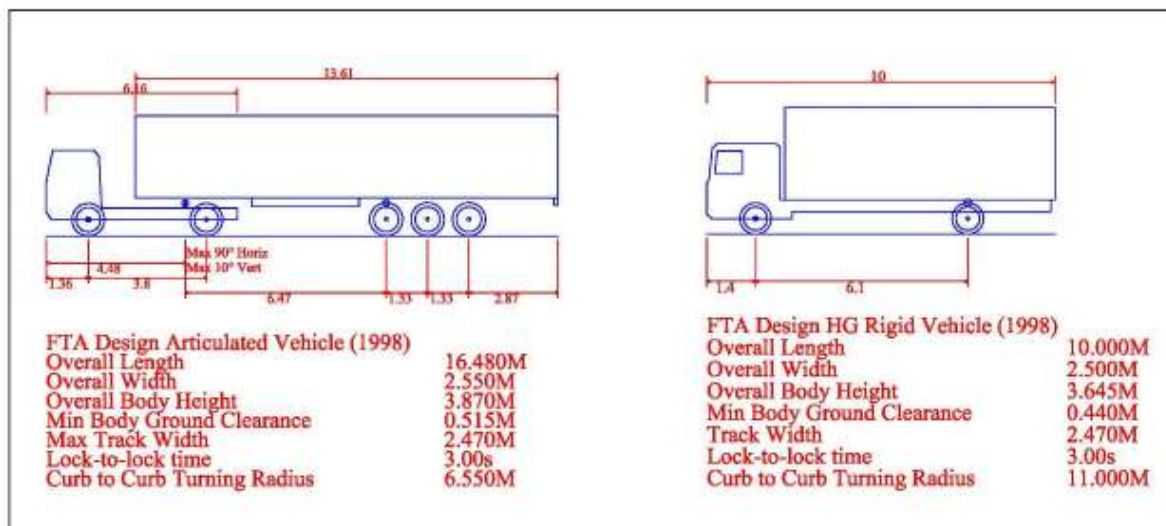
All workers vehicles will park on the Site to avoid obstruction to the operation of the public roadway, and this will be strictly enforced. Temporary signage will be used to prohibit parking of staff vehicles on the local road. The signage will direct drivers to the staff parking area.

### 11.5.3 Vehicles

The variety of vehicles that will need to access the Site during construction will include low-loaders to deliver plant/machinery and articulated goods vehicles to deliver materials (including mounting frames and solar panels). The dimensions of the largest of the typical vehicles likely to visit the Site during construction are shown in Figure 11-6.

Drivers of construction vehicles / HGVs will be advised that vehicular movements in sensitive locations, such as schools and local community areas, shall be restricted to 60km/h, or other as requested by Louth County Council. Such recommended speed limits will only apply to construction traffic and shall not apply to general traffic. It is not proposed to signpost such speed limits in the interest of clarity for local road users.

**Figure 11-6: Dimensions of a Typical Site Vehicle**



## 11.6 Measures, Management and Control Processes

A management structure and control processes will be put in place to implement, monitor and manage a CTMP. The appointed Site Manager will be responsible for the Site works which will ensure that the control processes are efficiently communicated and implemented.

This will be especially pertinent when instructing deliveries and route compliance for delivery drivers to either the Proposed and Phase 1 and Phase 2 permitted developments (compound A) or the permitted Phase 3 development (compound B).

### 11.6.1 Working Hours

Work will generally be between 07:00 and 19:00 Monday to Friday and between 07:00-13:00 on Saturdays. No construction activities will take place on Sundays or Bank Holidays.

### **11.6.2 Delivery of Plant and Materials**

The Contractor will be required to schedule all deliveries in such a way that construction activities and deliveries activities do not occur during peak traffic flows or run concurrently with other deliveries / activities. The contractor will also liaise with the management of the overall development and any other construction projects and the local authority to co-ordinate deliveries.

All materials associated with the development process will be stored within the appropriate site construction compounds:

- Skips and other plant will also be stored within the curtilage of the Site;
- A loading and unloading area for plant and materials is provided on the Site. It is anticipated that the majority of deliveries will be made via articulated vehicles; and,
- All car parking, by staff and others, will take place on the Site, not on the public road.

### **11.6.3 Route Compliance**

Use of the agreed vehicle route will be included as a contractual requirement of the Contractor and will be communicated to all drivers.

No temporary closures of public roads are expected to be required for construction of the development, but should exceptional circumstances arise that would require such a closure Louth County Council would be notified in advance and their consent sought through the statutory process required.

### **11.6.4 Vehicle Compounds**

All vehicles will use the two construction compound areas (A&B). The compounds will be capable of accommodating a turning vehicle to allow for vehicles to be held back during restricted periods.

All car parking, by staff and others will take place on the sites, within the construction compounds.

### **11.6.5 Waste Management**

- All surplus excavated materials will be reused within the overall development;
- Waste materials from grid connection trenching along the small sections of the public road will be reused as backfill or where necessary will be collected and stored in suitable receptacles before they are taken offsite transported to a suitably licensed waste facility in strict accordance with all requirements of the Waste Management Act and subsequent regulations:
- Foul waste that accumulates in the holding tank will be removed as required by a licensed waste contractor.
- Waste materials will not be allowed to accumulate because of the fire/vermin risk; and,
- All wastes will be appropriately segregated with the objective to maximise the level of recycling.

There will be no operational waste associated with the Proposed Development. The decommissioning plan prepared as part of the overall planning application addresses all aspects of waste management post the operational phase.

### **11.7 Site Manager**

A Site Manager will be appointed prior to the commencement of any works.

### **11.7.1 Transport Co-Ordination**

The Site Manager for the Proposed Development and the Permitted Developments and will undertake the transport co-ordination role for the Site. In this respect, their main responsibilities will include:

- Design and implementation of a CTMP;
- Vehicle / delivery scheduling to either Proposed Development and the Permitted Developments;
- Scheduling refuse collections;
- Handling complaints; and,
- Acting as a point of contact for employees, contractors and the general public.

### **11.7.2 Communication**

The Site Manager will be responsible for ensuring that there is adequate liaison between the following key stakeholders throughout the construction period:

- The Contractor;
- The Applicant;
- Site neighbours;
- Other local stakeholders such as emergency services or local transport providers and,
- The Planning Authority.

Prior to any works starting the Contractor will inform neighbours in close proximity to the sites of the nature of the works, proposed hours of work and their expected duration. In addition to this a notice will be placed at the main entrance to the Site informing neighbours of the hours of work. Meetings and telecommunication will be held between the Site Manager and the Council as required.

### **11.7.3 Complaints**

The Site Manager will provide any monitoring data, delivery schedules, complaints or breaches of agreements to the Planning Authority if requested. Furthermore, the Site Manager will be available to meet and explore issues with concerned neighbours. Complaints will be addressed immediately by the construction team and will be reviewed in weekly site meetings to ensure that any required actions are communicated to all employees. Contact details for the Site Manager will also be displayed at the Site entrance.

### **11.8 Assessment Conclusion**

The main potential period in which traffic issues might arise will be the temporary construction phase. The established existing access to sites for the Proposed Development and the Permitted Developments will provide a safe access for all construction vehicles.

The traffic management measures, as detailed in this chapter will minimise any potential roadway impacts, to ensure roadway safety and protect the amenity of the area surrounding the Site. The key element of these measures will be that all deliveries will be required to follow a specific route on arrival and departing from the two construction compounds, A or B. Trucks travelling along these dedicated routes will be managed by the contractor to minimise any potential disruption. There will be no potential for traffic impacts to arise during the operational phase of the Proposed Development.

## 12 CONCLUSIONS

### 12.1 Cumulative Impacts

There is a clear justification for the need for the Proposed Development, which will replace the 2No. permitted 37kV substations (21/631). The Proposed Development is in line with national action plans on greener energy. There has been extensive review of the planning history for the surrounding area and no cumulative impacts associated with the Permitted Developments (Phase 1, Phase 3 and Phase 3) are anticipated as a result of the Proposed Development. Furthermore, the Proposed Development will not give rise to any in combination impacts on ecological, landscape and visual, hydrological, acoustic, cultural heritage and traffic receptors.

### 12.2 Assessment Conclusions

MOR have prepared this ER in support of an SID application in respect of both the construction and operation of the proposed 2No. 110kV substations and grid connection in the townlands of Monvallet and Toomes Co. Louth.

The key conclusions of the ER are that the Proposed Development will not result in any likely or significant environmental impacts based on the following:

- The proposed design has taken full cognisance of all requirements of the Louth County Development Plan 2021-2027.
- The Permitted Developments will not be able to function as standalone developments as these will be reliant on connections to the Proposed Development in order to connect to the grid.
- The Ecological Assessment concluded that the lands within the Site are currently of low ecological value, and that the Proposed Development will not have any direct or indirect adverse impacts on the conservation objectives of any Natura 2000 sites or on any notable / protected flora and fauna.
- The Proposed Development will not require any alterations to the existing drainage network and no specific drainage infrastructure will be required.
- The landscaping proposed as part of the Permitted Developments will ensure that the Proposed Development will not result in any significant residual impacts on receptors in regard to direct visual impacts.
- Sufficient setbacks will be implemented from all sensitive receptors - adjacent dwellings, transport route receptors (road) and onsite tree / hedge lines and therefore no adverse effects either during construction or operational phase will occur.
- Detailed noise modelling concluded that there will be no cumulative noise impacts arising from the Permitted Developments and Proposed Development at any nearby receptors either during day or night-time periods.
- No protected archaeological monuments are located within the Site. There will be no impact on archaeological receptors as a result of the Proposed Development.
- The Proposed Development will be accessed via permitted development PR 21/631 access off the L5141. Safe sightlines have been achieved.
- A Preliminary Construction Environmental Management Plan (pCEMP) has been submitted in support of the planning application. This CEMP is a 'living document' and will be used by the appointed contractor to prepare an updated and comprehensive CEMP prior to the commencement of any onsite works. It is proposed

that this plan will be agreed with the Council in advance and will be fully implemented during the construction of the Proposed Development.

- The Proposed Development will have a design life of approximately 35 years at which time it will be fully decommissioned, and lands reinstated.

## 13 ENVIRONMENTAL COMMITMENTS

Commitment
<b>General</b>
<ul style="list-style-type: none"> <li>• Construction works will comply with all relevant legislation and best practice to reduce any potential environmental impacts;</li> <li>• A comprehensive Construction Environmental Management Plan (CEMP) will be submitted to the Planning Authority for approval prior to the commencement of construction works;</li> <li>• The contractor shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the ER;</li> <li>• Sufficient setbacks will be implemented from all sensitive receptors - adjacent dwellings, transport route receptors (road or rail), onsite tree / hedge lines and drainage ditches; and,</li> <li>• Construction works will be restricted to normal working hours, 07:00-19:00 Monday to Friday and 07:00-13:00 on Saturday with the exception of essential activities such as repairs. No construction activities will take place on Sundays or Bank Holidays.</li> </ul>
<b>Biodiversity</b>
<p><b>General Measures – Construction</b></p> <ul style="list-style-type: none"> <li>• An ecological clerk of works (ECoW) will inspect the Site before works commence and will undertake Site inspections as required during the works;</li> <li>• In advance of works, all Site personnel will receive an induction which will include reference to mitigation measures in relation to protected species;</li> <li>• During construction, all boundary trees and treelines that are to be retained will be protected from unnecessary damage;</li> <li>• All works and solar farm infrastructure will be set back a minimum of 6m to ensure that no impacts occur on existing hedge / treeline;</li> <li>• All works and solar farm infrastructure will be set back a minimum of 6m to ensure that no impacts occur on existing drainage ditches / streams (where they occur as part of the overall development);</li> <li>• Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required;</li> <li>• All vehicles, machinery and any other equipment that may be used for the works will be washed and cleaned as required prior to being used on the Site to prevent the import of plant material / seeds.</li> </ul>
<p><b>Protection for Fauna:</b></p> <p><u>Badgers</u></p>

<b>Commitment</b>
<ul style="list-style-type: none"><li>• Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed;</li><li>• Obvious mammal paths will be left clear of obstruction to allow for the free movement of smaller mammals throughout the landscape; and,</li><li>• If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.</li></ul> <p><u>Amphibians</u></p> <ul style="list-style-type: none"><li>• If amphibians are encountered during operations at the overall development, works will stop within the specific area and a suitably qualified ecologist will be contacted for advice.</li></ul> <p><u>Birds</u></p> <ul style="list-style-type: none"><li>• Any vegetation clearance and the clearance works required for the scrape creation will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;</li><li>• In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS; and,</li><li>• Should birds nest within the active working area during the construction phase, works within the area will stop within the area and the project ECoW will be consulted.</li></ul>
<b>Water Quality</b>
<ul style="list-style-type: none"><li>• Preventative maintenance and relevant maintenance logs will be kept for all onsite plant and equipment;</li><li>• Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;</li><li>• All materials shall be stored at the main contractor compound and transported to the works zone immediately prior to construction;</li><li>• Any chemical / oils to be stored on Site will be placed within a bund on an area of hardstanding to ensure there is no seepage of pollutants into groundwater or surface water;</li><li>• All bunds will have the capacity of the largest tank volume plus 10 percent, at a minimum, with additional capacity to hold 30mm of rainfall;</li><li>• Adequate spill kits including absorbent booms and other absorbent material will be maintained onsite;</li><li>• All contractor workers will be appropriately trained in the use of spill kits;</li><li>• Weather conditions will be considered when planning construction activities to minimise risk of runoff from Site;</li><li>• Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks will not be permitted on the Site;</li><li>• Any spillage of cementitious materials will be cleaned-up immediately;</li></ul>

<b>Commitment</b>
<ul style="list-style-type: none"><li>• Any sediments impacted by contamination will be excavated and stored in appropriate sealed containers for disposal offsite in accordance with all relevant waste management legislation;</li><li>• All drainage from bund areas must be directed to secure containment prior to suitable disposal;</li><li>• Fuel will be delivered onsite by a dedicated tanker or in a delivery bowser dedicated to that purpose;</li><li>• The Appointed Contactor will put in place a specific, step-by-step refuelling procedure which will be communicated to all relevant employees onsite;</li><li>• Fuels, lubricants and hydraulic fluids for equipment used in the construction phase will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to current best practice;</li><li>• Vehicle or equipment maintenance work will be carried out in a designated area on the Site. In the event that refuelling is required outside this area a spill tray will be employed during the refuelling operation;</li><li>• Prior to any works commencing, all construction equipment will be checked to ensure that they are mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids and grease;</li><li>• The drilling rig and fluid handling units will be located on the entry side and will be appropriately banded using sandbags, which will contain any fluid spills and stormwater run-off.</li><li>• Entry and exit pits will be excavated using an excavator, and the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility.</li><li>• The ducts will be cleaned and proven and their installed location surveyed.</li><li>• The entry and exit pits will be reinstated to the specification of ESB Networks and any requirements of Louth County Council. No surface water runoff will be discharged onto public roads, foul sewers or adjacent property; and,</li><li>• Measures will be implemented to minimise waste and ensure correct handling, storage and disposal of waste.</li></ul>
<b>Noise and Vibration</b>

Commitment	
<p><b>Construction</b></p> <ul style="list-style-type: none"> <li>• Activities and deliveries to the Site to occur only during permitted hours;</li> <li>• The following noise limits will apply to the facade of dwellings during construction activities (BS5228 ABC Method for assessing Construction Noise Impact); and,</li> </ul>	
<b>Day &amp; Times</b>	<b>L<sub>Aeq</sub>, dB</b>
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65
<ul style="list-style-type: none"> <li>• A Site Representative will be appointed to receive and respond to any noise complaints received from local residents, the Local Authority and any other regulatory body.</li> </ul>	
Landscape and Visual	
<ul style="list-style-type: none"> <li>• A comprehensive landscape plan will be implemented onsite as part of PR 21/631</li> </ul>	
Material Assets – Traffic	
<ul style="list-style-type: none"> <li>• Road warning signage indicating traffic movements will be erected. Temporary signage will be used to highlight the two separate entrances to the Proposed Development and the Permitted Developments to direct construction traffic to the sites from the national and regional roads;</li> <li>• All construction phase materials to be delivered to the Site via the L5141 (Tullycahan &amp; Toomes) to construction compound A. All construction phase materials for the Phase 3 permitted development will be via the L5141 (Drumgoolan Rd.) to construction compound B (refer to Figure 11-5).</li> <li>• A loading and unloading area for plant and materials is provided on the sites;</li> <li>• All car parking, by staff and others, will take place on the Site, not on the public road; and,</li> <li>• The appointed contractor will be required to prepare a detailed traffic management plan.</li> <li>• All construction vehicles arriving and departing from the Proposed Development and the Permitted Developments will follow a dedicated route – See Figure 11-1. This route has been carefully selected to maximise the use of the National Road network, to avoid urban centres and towns. All truck drivers will be notified of this route in advance of commencement of their journey. The main contractor will strictly enforce the traffic management plan to ensure that all construction vehicles will follow this route. Deliveries to the Site will be carefully coordinated to minimise the risk of arriving and departing trucks meeting on the L5141. If required departing trucks will be held onsite until a truck delivering to the Site has arrived.</li> </ul>	

### Commitment

- Construction traffic will cross the L5141 and the public road (cul de sac) in a controlled manner. To ensure safe passage for both construction and public traffic at this location, trained flagmen will be assigned to control such movements. Flagmen will wear high visibility vests and use approved Stop/Go signs. The flagmen will be in visible contact or in voice communication with each other at all times
- The appointed contractor will provide an updated CTMP in advance of works.

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