6 BIODIVERSITY

This chapter has been reviewed and updated where necessary considering any subsequent modifications, updates and additional information acquired for the Further information Request issued by Louth County Council (LCC) on the 6th February 2025 (Reference No: 2460766). It is noted that for ease of reference all changes from the original chapter are shown in orange. Where text has been removed it is shown as ~~strikethrough.~~

Following a review of the proposed development based on the Request for Further Information, it has been determined that site entrance 4 is not required for the construction, operation and decommissioning of the proposed development, as all works can be accommodated via the proposed site entrances 1-3. Therefore, it is proposed that entrance 4 will not be taken forward as part of the proposed development, and the initially proposed use of entrance 4 will instead be accommodated at entrance 2. The author of this chapter has reviewed the revision, and no implications for the assessment presented in this chapter have been identified. There are no changes proposed to the red line boundary so the assessment of the baseline ecological conditions remains unchanged. The assessment of entrance 4 has been removed from this chapter.

6.1 INTRODUCTION

This chapter assesses the likely significant effects of the Proposed Development on terrestrial ecology, and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual ecological effects are then assessed.

The Proposed Development refers to all elements of the application within the Redline Boundary, as set out in detail in **Chapter 2: Description of the Proposed Development**.

This chapter also assesses the proposed works along the Turbine Delivery Route (TDR), which are outside of the Proposed Development Redline Boundary but part of 'The Project'.

The assessment considers the potential effects during the following phases of the Proposed Development:

- Construction of the Proposed Development
- Operation of the Proposed Development
- Decommissioning of the Proposed Development

This chapter of the EIAR is supported by Figures (6.1 - 6.8) provided in Volume III and by the following Appendix document provided in Volume IV of this EIAR:

- **Appendix 6.1 Biodiversity Enhancement and Management Plan (BEMP)**

A Construction and Environmental Management Plan (CEMP) is appended to the EIAR in Technical **Appendix 2.1**. This document will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect biodiversity and the environment, are implemented.

6.1.1 Development Description

Planning Permission is being sought by the Developer for the construction of 5 no. Wind Turbines, a Permanent Met Mast, a 38kV Onsite Substation and Control Building, a Battery Energy Storage System within the substation compound, all ancillary works and the construction of an underground Grid Connection to Drybridge 110kV Substation, Co. Louth.

A detailed description of the Proposed Project has been included in **Chapter 2: section 2.3 Project Description**. An outline of the Proposed Project is as follows:

- The Construction of 5 no. wind turbines.
- Construction of Crane Hardstand areas and Turbine Foundations.
- Construction of new internal site Access Tracks and upgrade of existing site roads, to include passing bays and all associated drainage.
- The provision of 2 no. new permanent site entrances with access onto the local road L6274 in the townlands of Kearneystown and Gallstown. This will include removal of existing vegetation for visibility splays to facilitate the use of it for the delivery of construction materials to the site.
- The permanent realignment of 1 no. existing entrance for construction and operational access to the 38kV electrical substation compound from the local road L2275
- The provision of an existing site entrance No. 4 on a private road in the townland of Drumshallon which connects to the local road L2275.
- The construction of 3 no. Temporary Construction Compounds with associated temporary site offices, parking area and security fencing.
- The provision of two permanent spoil storage areas
- The construction of 1 Permanent meteorological mast of 36m.
- Development of a site drainage network.
- Development of biodiversity enhancement measures.

- Construction of 1 no. permanent 38kV Substation with 1 no. control building with welfare facilities, all associated electrical plant and equipment, security fencing, lightening protection, security cameras and gates, all associated underground cabling wastewater holding tank, and all ancillary structures and works.
- Battery Energy Storage System (BESS) within the substation compound including 4 no. battery storage bays of 8 no. battery units.
- All associated wind farm underground electrical and communications cabling connecting the turbines and masts to the Onsite Substation, including a section in the public road corridor the townlands of Gallstown and Kearneystown.
- Ancillary forestry felling to facilitate construction and operation of the Development.
- Operational stage site signage.
- The construction of 1 no. new road in the townland of Castletown at the R162 / L-6274-0 Junction to facilitate the delivery of the turbine components.
- All works associated with the connection of the onsite substation to the national electricity grid via the existing Drybridge 110 kV Substation located in the townland of Tullyallen; The cabling will be located within the public road corridor or existing tracks for its entire length. The total length of the proposed 38kV underground cable connection is 12.65 km.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought.

This chapter is an EIA of the Proposed Development on Biodiversity. A full description of the Proposed Development is outlined above and in section 2.3 of Chapter 2 and includes one TDR (the Proposed TDR) and one GCR (the proposed GCR). Other viable GCR/TDRs have also been assessed as part of the EIAR. Although planning permission is not being sought for these viable routes (GCR option 2 and TDR option 2 and TDR option 3) they have been fully assessed. All EIA aspects of GCR option 2 and TDR option 2 and 3 are documented in Appendix 3.1. Refer to section 5 of Appendix 3.1 for the Biodiversity assessment for GCR option 2 and TDR option 2 and 3.

6.1.2 Project Team

This ecology chapter has been prepared and updated by Dr. Brian Madden (BioSphere Environmental Services) and is informed by ecological survey data and relevant reports from various ecologists as listed in **Table 6.1** below.

Table 6.1: Personnel involved in ecological assessment.

Project Team Member	Qualifications & Experience	Role
Dr Brian Madden, BioSphere Environmental Services	BA. Mod. (Hons), PhD, MCIEEM Brian graduated in Natural Sciences from the University of Dublin in 1984 and earned a Ph.D. degree in 1990 from the National University of Ireland for his research on ecosystem processes in raised bogs. Since 1994, Brian has been the principal ecologist with BioSphere Environmental Services. Brian has carried out botanical surveys and habitat assessments for most terrestrial habitats which occur on the island of Ireland. He is also an experienced ornithologist, with particular interests in birds of prey and wetland birds. He has published a range of peer-reviewed research papers. Examples of energy projects that Brian has been involved in include: Grousemount Wind Farm, Cos. Cork/Kerry, Oweninny Wind Farm Phases 1 & 2, Co. Mayo, Castlepook Wind Farm, Co. Cork, Letteragh Wind Farm, Co. Clare, Kiltumper Wind Farm Co. Clare, Eglish Wind Farm, Co Tyrone, Connemara 110kV Overhead Line Reinforcement Project (40 km from Barna to Screeb Bay in Connemara.	Preparation of EIAR: Chapter 6; baseline habitat assessment; terrestrial mammal survey
Dr John Conaghan, Enviroscope Environmental Consultancy	BSc, PhD, MCIEEM John graduated in Science from University College Galway in 1990, specialising in botany, and subsequently carried out research into the ecology of fens in Ireland for his Ph.D dissertation. John has over 25 years' experience of working on botanical projects throughout Ireland. He is a habitat specialist, with particular expertise in peatland, fen and wetland habitats, as well as rare plants. John has worked with Coillte on their LIFE funded habitat restoration programme - he regularly contributes this expertise to Species and Habitat Management Plans. Examples of energy projects that John has been involved in include: Oweninny Wind Farm Phases 1 & 2, Co. Mayo, The Galway Wind Park, Grousemount	Advisory role for habitat and botanical surveys

Project Team Member	Qualifications & Experience	Role
	Wind Farm, Cos. Cork/Kerry, Castlepook Wind Farm, Co. Cork, BGE Corrib Gas Pipeline from Bellanaboy, Co. Mayo to Craughwell, Co. Galway.	
Joe Adamson, BioSphere Environmental Services	BSc, MSc, MCIEEM Joe graduated for University College Dublin in 1994 having studied Environmental Resource Management. He is a highly experienced ecologist, having worked both in Ireland and overseas since 1988. Joe is the principal mammal and bird expert with BioSphere Environmental Services and has worked on a range of wind farm and solar farm energy projects. Examples of energy projects that Joe has been involved in include Oweninny Wind Farm Phases 1 & 2, Co. Mayo, Grousemount Wind Farm, Cos. Cork/Kerry, Castlepook Wind Farm, Co. Cork, and Letteragh Wind Farm, Co. Clare.	Baseline terrestrial mammal surveys

6.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

6.2.1 Purpose of the Report

The purpose of this report is to:

- Establish and evaluate the baseline ecological environment as relevant to the Proposed Development.
- Identify, describe and assess all potentially significant ecological effects associated with the Proposed Development.
- Set out the prevention and mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation.
- Provide an assessment of the significance of any residual ecological effects.
- Describe effects of the Proposed Development both alone and cumulatively with other projects.
- Identify any appropriate enhancement and / or post-construction monitoring requirements.

6.2.2 Relevant Legislation and Policy

The main pieces of legislation relevant to this chapter are as follows:

- The Wildlife Acts 1976 – 2023 as amended
- The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) as amended
- European Communities (Birds and Natural Habitats) Regulations 2011 - 2021
- Flora (Protection) Order, 2022 (S.I. No. 235 of 2022)
- Local Government (Water Pollution) Act, 1977 (as amended)

In considering ecological survey and assessment of impacts of the Proposed Development, the following key guidance and information documents were complied with:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).
- European Commission (2017) Environmental Impact Assessment of Projects. Guidance on the preparation of the Environmental Impact Assessment Report. (Directive 2011/92/EU as amended).
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes.
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- Fossitt (2000). A Guide to Habitats in Ireland. Heritage Council, Kilkenny.
- Smith *et al.* (2011). Best Practice Guidance for Habitat Survey and Mapping in Ireland.

6.2.3 The Study Area

For habitats and flora species, the main study area is all land within the Redline Boundary. However, assessments were made for sensitive habitats, such as bogs and fens, or protected or rare plant species (including bryophytes), to a distance of up to 1 km of the Redline Boundary, or to further distances should ecological or hydrological connectivity exist.. Such habitats may be part of designated sites at a national or international level.

For badger, the main study area was a distance of approximately 100 m of the proposed infrastructure locations (in compliance with NRA 2006 & NRA 2009b). For otter, the main study area was a distance of at least 150 m upstream and downstream of the sections of river potentially affected by the proposed infrastructural works, including the margins of the river to a distance of 10 m width. Generally, the potential of watercourses to support otter was based on stream size and water quality. The effect of potential contaminants in

drainage run-off on quality of suitable otter habitat downstream of the Proposed Development Site was also assessed.

For other protected mammal species, such as Irish hare and red squirrel, the study area was confined to the Proposed Development Redline Boundary.

6.2.4 Zone of Influence

The Zone of Influence (ZoI), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present within, and in the vicinity of, the Proposed Development. The ZoI and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the Proposed Development.

The ZoI in relation to direct impacts on habitats and flora and fauna species as a result of Kellystown Wind Farm will be confined to the area within the Redline Boundary of the Proposed Development, including the Grid Connection and Turbine Delivery routes.

The ZoI of general construction activities (*i.e.* risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) extend to up to 500 metres from the proposed Redline Boundary.

The ZoI of potential impacts on surface water quality in the receiving environment, and associated aquatic flora and fauna, extended downstream for up to 15 km (following UK guidance, Scott Wilson *et al.* 2006). For the Turbine Delivery Route, the ZoI is confined to the portions of the route where road upgrade works are required.

6.2.5 Desk Study

A comprehensive desktop review was carried out to identify features of ecological importance within the Proposed Development area and surrounding region to a distance of at least 15 km (in the case of designated sites). This comprised a review of available ecological data, including the following:

- Online web-mapper of National Parks and Wildlife Service (NPWS) for data on sites designated for nature conservation (European & National) and on protected flora species and protected bryophytes (see www.npws.ie/protected-sites, last accessed 02/10/2024),

- Online web-mapper of National Biodiversity Data Centre for protected species datasets (see http://maps.biodiversityireland.ie, last accessed 18/09/2024)

6.2.6 Consultation

As part of the study, consultation was made with the following relevant ecological parties:

- National Parks and Wildlife Services of the Department of Housing, Local Government and Heritage (no response received – see **Table 1.14, Chapter 1**)
- BirdWatch Ireland (no response received)
- An Taisce (no response received)
- Irish Peatland Conservation Council (no response received)

6.2.7 Field Surveys

6.2.7.1 Habitats, vegetation and flora

The site of the Proposed Wind Farm Development was visited on the following dates: 21st and 22nd June 2023, 15th December 2023[1] and 17th September 2024.

Walkover surveys were carried out where proposed wind farm infrastructure is located, with focus on the location of each turbine and associated site access tracks. The surveys also included the proposed substation and operations buildings, temporary compounds, and the proposed met mast location.

The Grid Connection Route and the relevant sections of the Turbine Delivery Route were surveyed by driving the routes with stops for a walkover inspection at potential areas of ecological interest or where works are proposed.

Habitats within the study area were classified in accordance with 'A Guide to Habitats in Ireland' (Fossitt 2000). The dominant plant species present in each habitat type were recorded during the field surveys. This is considered sufficient to allow accurate classification of the habitats present. The extents and details of classified habitats were recorded and mapped using GIS. Where relevant, linkages with the EU Habitats Directive classification system are given.

During the various site surveys particular attention was paid to the possible occurrence of plant species listed in either the Flora (Protection) Order 2022 or the Irish Red Data Books

[1] While December is outside of botanical survey season, it is a suitable time of year for identifying bryophytes

(Curtis and McGough 1988, Lockhart *et al.* 2012). Vascular plant species nomenclature in this report follows Stace (2010) while that of mosses follows Smith (2004).

During the surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2021 was conducted[2]. Invasive alien species which are widespread in Ireland, including Co. Louth, include Japanese knotweed, giant hogweed and Himalayan balsam.

The mapping of habitats was assisted by the use of aerial photography (OSI Geohive & BING online websites).

6.2.7.2 Terrestrial fauna

Multi-disciplinary walkover surveys of the Wind Farm Site were carried out on 30th October 2023, 12th December 2023 and 22nd February 2024 in accordance with NRA guidelines on Ecological Surveying Techniques for Protected Flora and Fauna during the planning of National Road Schemes (NRA, 2009b).

The walkover surveys were designed to detect the presence, or likely presence, of all mammal species but with a focus on protected species such as badger *Meles meles* and otter *Lutra lutra*. Terrestrial mammal species were detected by direct observations and by search for signs, such as dwellings (*e.g.* setts), tracks or feeding signs.

At the Wind Farm Site, survey for badger was focused on hedgerows, treelines and areas of broadleaved woodland within a distance of at least 100 m of the wind farm infrastructure. Due to the difficulty of surveying within mature conifer plantation, focus was placed on the margins of the stands and on tracks through the plantations. The areas were walked and checked for signs of badger presence, including setts, latrines, snuffle holes, prints, paths and tree scratching.

For otter, emphasis was placed on impact locations of rivers and stream courses within the Wind Farm Site. In practice, this comprised searches along the watercourse sections of the Drumshallon Lough Stream (from the lake) and the Piperstown Stream within the site as far as the local road to the east of site, and the Slieveboy Stream to the local road to the north of site. Search was made for signs of otters, such as spraints, prints, slides, trails and holts along both banks of the stream (as feasible). The dedicated otter survey followed the

[2] http://Invasives.biodiversityireland.ie/

guidance as set out in NRA (2008) *Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes.* The otter survey was supplemented by detailed stream survey information from the Aquatic Ecology Assessment (**Chapter 9: Aquatic Ecology**).

Habitats within the Wind Farm Site were evaluated for their potential to support breeding amphibians, namely the common frog *Rana temporaria* and the smooth newt *Lissotriton vulgaris,* as well as the common lizard *Zootoca vivipara,* with any sightings recorded whilst carrying out the habitat and mammal surveys.

6.2.7.3 Marsh Fritillary

An assessment of the status of the food plant (devil's-bit scabious *Succissa pratensis*) of marsh fritillary *Euphydryas aurinia* was carried out at the time of the botanical survey of the site. This was in accordance with the following:

"Ireland's Butterfly Series: Habitat management for the Marsh Fritillary" (Phelan *et al.* 2021) – in this reference, the following is noted:

Habitats that are in good condition for Marsh Fritillary should have three or more well-developed Devil's-bit Scabious plants per square metre, across more than twenty percent of the habitat.

"Ireland's Butterflies: A Review" (Nash *et al.* 2012), in this reference, for marsh fritillary the following is noted (pg. 186):

"All 'good sites' should have a very substantial amount of Devil's- bit Scabious."

6.2.7.4 Survey Limitations

The information provided in this assessment accurately describes the baseline ecological environment within the area of the Proposed Development, as well as the relevant sections of the Turbine Delivery Route.

The specialist surveys, analysis and reporting have been undertaken in accordance with the appropriate guidelines and within the recommended seasonal time periods (which included a site survey in December when bryophytes are most obvious).

It is concluded that no technical difficulties were encountered during the baseline surveys.

6.2.8 Assessment Approach

The ecological evaluation approach used in this report complies with "Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009a). The impact

assessment approach is based on "Guidelines on the information to be contained in Environmental Impact Assessment Reports" (EPA 2022).

6.2.8.1 Key ecological receptors

Ecological receptors can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the Wind Farm Site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

6.2.8.2 Determining importance of ecological receptors

The importance of an ecological receptor is considered within a defined geographical context. The following frame of reference has been used in this case (based on NRA Guidance 2009), relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International and European
- National
- County
- Local Importance (higher value)
- Local Importance (lower value)

The above frame of reference is applied to the ecological receptors identified during the desk study and baseline surveys to inform this report.

The value of habitats and flora has been measured against published selection criteria where available. Examples of relevant criteria include habitats listed on Annex 1 of the Habitats Directive as amended and flora species listed on the Flora (Protection) Order 2022 or on the Irish Red List (Curtis & McGough 1988).

In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive (as amended) or Annex 1 of the Birds Directive (as amended)), Birds of Conservation Concern in Ireland, species protected under the Wildlife Acts as amended etc.

For the purposes of this report ecological receptors of Local importance or greater, and/or subject to legal protection, have been subject to detailed assessment. Effects on ecological receptors rated Local Importance (lower value) are considered unlikely to be significant in legal or policy terms.

6.2.8.3 Characterisation of Impacts and Effects

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

When describing impacts, reference has been made to the following characteristics, as appropriate (in accordance with EPA 2022):

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary habitat process or feature, *e.g.* the construction of a Site access track which causes local hydrological changes, which, in the absence of mitigation, could lead to the drying out of peat bog.

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

6.2.8.4 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of ecological impact assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific, *e.g.* for a designated site, or broad, *e.g.* national/local nature conservation policy, or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA 2022) were adhered to when determining significance and the present assessment is in accordance with those guidelines. Details of the EPA Guidelines, including the criteria used for determining the significance of effects, are presented in **Chapter 1: Introduction.**

6.2.8.5 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

6.2.8.6 Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the EPA (2022) and CIEEM (2022) Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the impact assessment to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, *e.g.* through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, *i.e.* where mitigation *in situ* is not possible.
- Enhancement is improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which may be unrelated to a negative impact or is 'over and above' that required to mitigate/compensate for an impact.

6.3 BASELINE ECOLOGICAL CONDITIONS

6.3.1 Physical and General Ecological Description of Site

The Proposed Development is located in the southern part of County Louth, approximately 8.3 km north of Drogheda and approximately 3 km south-southeast of the village of Dunleer (see **Chapter 1: Figure 1.2**). The Wind Farm Site lies approximately 6.5 km from the County Louth coastline and is situated generally due west of the Clogher Head promontory. The Site is accessed via local public roads which branch off from the R132. The M1 motorway is located approximately 2.5 km to the west.

The Redline Boundary of the Wind Farm Site covers a total area of 64.5 ha. The Wind Farm Site is situated within 12 no. townlands (see **Chapter 2**: **section 2.4, Site Location and Environs**), while the Grid Connection route, which will connect to the existing Drystone 110kV Substation just off junction 10 of the M1, will pass through 13 no. townlands.

The Wind Farm Site is situated within an agricultural landscape used for both pastoral and arable farming. The agriculture practised is generally of an intensive nature. Commercial forest plantations occur scattered through the landscape though are of a relatively small size. Quarries are a feature of the wider area, with Kilsaran Quarry adjoining the northern part of the Site for the wind farm. The Piperstown Livery and Equestrian Centre adjoins the southern part of the Site for the wind farm.

The elevations within the Wind Farm Site range from approximately 91 m to 126 m above Ordnance Datum, with a rise across the site from the southeast to the north.

The bedrock geology underlying the Wind Farm Site is mapped predominantly as the Clogherhead Formation, which consists of thickly bedded calcareous greywacke (siltstone). This outcrops within the western portion of the site (see details in **Chapter 12: Soils and Geology**). Superficial soils present within the Site consist of thin glacial till soils. Thicker glacial tills derived from Lower Palaeozoic sandstones are present towards the south and east of the site. Alluvium is present throughout the site, mainly associated with river valley bottoms.

The site drains eastwards towards the Irish Sea via several streams, as follows:

- the Hammondstown Stream, which meets the sea c.20 km downstream at Annagassan Port in Dundalk Bay;
- the Slieveboy Stream, which goes to sea c.11 km downstream at Port/Lurganboy Beach;
- the Piperstown Stream and Drumshallon Lough Stream, which join together as the Termonfeckin Stream and enter the sea c.8.5 km downstream of the Site, at Termonfeckin Beach.

The Wind Farm Site study area is dominated by Improved agricultural grassland (GA1), Arable land (BC1) and Conifer plantation (WD4). The fields are bounded by mostly Hedgerows (WL1), Treelines (WL2) or woodland edge, with stone walls also present. Scrub (WS1), predominantly gorse and blackthorn, is a feature of the Site. Ecologically, the feature of highest value is the Drumshallon Lough wetland system, which comprises a mesotrophic lake (FL4) associated with wet woodland (WN6), Wet grassland (GS4), Marsh (GM1) and a small area of Transition mire (PF3) (latter Annex I listed habitat). Two stands of mature Broadleaved woodland (WD1) occur on site and are also of ecological note. Grassland which is managed at a low intensity (classified as Neutral grassland GS1) is

present on site, along with a small Gravel/sand quarry (ED1) and some other Disturbed (ED) habitats.

The Grid Connection, which extends over a length of 12.65 km, is entirely along public roads (BL3) apart from the section within the wind farm site. The local roads typically are lined with low hedgerows (WL1) and grassy verges (GS2).

The Turbines Delivery Route from Galway Port, Co. Galway is entirely along existing public roads (BL3).

From a wider conservation perspective, the Dundalk Bay system and the River Boyne and Estuary system are the dominant features of the area.

6.3.2 Designated Sites

The potential for the Proposed Development to impact on sites that are designated for nature conservation is considered in this Environmental Impact Assessment Report.

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are designated under the EU Habitats Directive as amended and EU Birds Directive as amended respectively and are collectively known as 'European Sites'. The potential for significant effects on the integrity of European Sites is fully assessed in the Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS) that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive".* **Section 6.4.2** of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 (as amended) and their management and protection is provided for by this legislation and planning policy.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these sites is fully considered in this report.

All designated sites that could potentially be affected were identified using a Source-Pathway – Receptor model. To provide context for the assessment, European and national sites within a distance of 15 km surrounding the Wind Farm Site have been considered and are shown in **Figures 6.1** to **6.3** in **Vol III** of the **EIAR** respectively. The distance of 15 km for European sites follows The "Guidance for Planning Authorities" from the Department of Environment, Heritage and Local Government (2010) - the following is noted in section 3.2.3 "Natura 2000 Sites":

> "The second stage (of the AA Screening process) is an examination of what Natura 2000 sites might be affected. These sites should be identified and listed, bearing in mind the potential for a plan or project, whether it is within or outside a Natura 2000 site, to have direct, indirect or cumulative effects, and taking a precautionary approach so that a site is included if doubt exists".

The approach to screening is likely to differ somewhat between plans and projects, depending on scale and on the likely effects, but the following should be included:

1. Any Natura 2000 sites within or adjacent to the plan or project area.
2. Any Natura 2000 sites within the likely zone of impact of the plan or project. A distance of 15 km is currently recommended in the case of plans, and derives from UK guidance (Scott Wilson et al. 2006). For projects, the distance could be much less than 15 km, and in some cases less than 100 m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in-combination effects.
3. Natura 2000 sites that are more than 15 km from the plan or project area depending on the likely impacts and the sensitivities of the ecological receptors, bearing in mind the precautionary principle. In the case of sites with water dependent habitats or species, and a plan or project that could affect water quality of quantity, for example, it may be necessary to consider the full extent of the upstream and/or downstream catchment."

However, sites that were further away from the Proposed Development were also considered where there is possible ecological and hydrological connectivity. Information on the identified sites according to the site-specific conservation objectives (as available) is provided in **Tables 6.2** and **6.3**.

It is noted that no part of the Proposed Development area is within, or adjoins, a site with a nature conservation designation.

6.3.2.1 European designated sites

Ten European designated sites occur within a 15 km distance of the Wind Farm Site (see **Figures 6.1 & 6.2**). These are listed in **Table 6.2**, along with the reasons for designation, the distance from the Proposed Development and whether any linkages or connectivity exist between the European site and the Proposed Project area.

The site for the Proposed Development is not within or adjacent to any designated European site. The Boyne Coast and Estuary SPA and SAC and the North-West Irish Sea SPA are the closest sites to the Wind Farm Site, at a distance of approximately 7.0 km, while the other identified sites are at varying distances up to 12.3 km. The Grid Connection Route passes over watercourses that flow into the River Boyne and River Blackwater SAC (c. 1 km closest distance). On this basis, it can be concluded with full certainty that there could be no direct impacts, such as loss of habitat or physical disturbance of habitats or species, by the construction, operational and/or decommissioning phases of the Proposed Development on any European designated site.

As outlined in **Table 6.2**, three sites are identified which have hydrological connectivity with the Proposed Development Site - these are Boyne Coast and Estuary SAC, the River Boyne and River Blackwater SAC and North-West Irish Sea SPA.

For the other listed European sites, there is no ecological or hydrological connectivity with any component of the Proposed Development.

The European sites relevant to the Proposed Development are considered in detail in the AA Screening Report and NIS which accompany this application.

Table 6.2. Relevant European sites, reasons for designation, distances from Project Area and summary of connectivity.

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
	SPECIAL AREAS OF CONSERVATION	
Clogher Head SAC (site code 001459)	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] According to this SAC's site Conservation Objectives document: NPWS (27 Jan 2017) Conservation Objectives: Clogher Head SAC [001459], Version 1.0. Department of Arts, Heritage,	The proposed Wind Farm Site is approximately 7.5 km west from the SAC. There is no ecological or hydrological connectivity

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
	Regional, Rural and Gaeltacht Affairs, for each of the listed QIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.	between the wind farm site and the SAC. The route of the Grid Connection is at a closest distance of approximately 8 km from the SAC, while the Turbine Delivery Route is approximately 11 km from the SAC. It is concluded that there is no connectivity between the Project area and the SAC.
Boyne Coast and Estuary SAC (site code: 001957)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] *Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] According to this SAC's site Conservation Objectives document: NPWS (31 Oct 2012), Conservation Objectives for Boyne Coast and Estuary [001957]. Version 1.0. Department of Arts, Heritage and the Gaeltacht, for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed Wind Farm Site is approximately 7 km from the SAC (closest straight-line distance). Much of the Site drains to the Drumshallon Lough Stream, which flows eastwards and enters the sea downstream of Termonfeckin, at the northernmost tip of the SAC (channel distance of c.8.5 km). Parts of the Grid Connection Route cross watercourses that flow to the Boyne Estuary and Termonfeckin Stream. The Turbine Delivery Route does not cross any watercourse that flows into the SAC . It is concluded that there is hydrological connectivity between the

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
		Proposed Development and the SAC.
River Boyne and River Blackwater SAC (site code: 002299)	Alkaline fens [7230] *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Lampetra fluviatilis (River Lamprey) [1099] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355] According to this SAC's site Conservation Objectives document: NPWS (2021): Conservation Objectives: River Boyne and River Blackwater SAC, Version 1 [002299]. Department of Housing, Local Government and Heritage, for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed Wind Farm Site is approximately 8 km northwest of the SAC (closest straight-line distance), and is not within the River Boyne catchment. However, parts of the Grid Connection Route and the Turbine Delivery Route cross watercourses that flow to the River Boyne and the SAC. It is concluded that there is hydrological connectivity between the Project area and the SAC via the GCR and the TDR.
Dundalk Bay SAC (site code: 000455)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] According to this SAC's site Conservation Objectives document: NPWS (19 July 2011), Conservation Objectives for Dundalk Bay SAC [00455]. Version 1.0. Department of Arts, Heritage and the Gaeltacht, for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed Wind Farm Site is approximately 8.3 km south of the SAC (closest straight-line distance). A section of the Site drains to the Hammondstown Stream which is within the River Dee catchment and enters the sea at Annagassan in Dundalk Bay. The GCR does not cross any watercourse that flows to Dundalk Bay. Part of the TDR crosses watercourses that are

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
		within the River Dee catchment. It is concluded that there is hydrological connectivity between the Project area and the and the SAC.
	SPECIAL PROTECTION AREAS	
Stabannan-Braganstown SPA (site code: 004091)	Greylag Goose (Anser anser) [A043] According to this SPA's site Conservation Objectives document: NPWS 15 Nov 2022, Conservation Objectives: Stabannan-Braganstown SPA 004091. Version 1.0, Department of Housing, Local Government and Heritage, for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The proposed Wind Farm Site is located approximately 9.4 km south-southeast of the SAC (closest straight-line distance). The GCR and the TDR are at a similar distance from the 7 km from the SPA. The Wind Farm Site has no history of supporting grazing geese and none were recorded feeding within or flying over the Site during baseline surveys (EIAR Chapter 8). It is noted that the greylag geese associated with the SPA roost at night in Dundalk Bay (NPWS site synopsis). It is concluded that there is no connectivity between the Project area and the SPA.
Dundalk Bay SPA (site code: 004026)	Great Crested Grebe (Podiceps cristatus) [A005] Greylag Goose (Anser anser) [A043] Light-bellied Brent Goose (Branta bernicla hrota) [A046] Shelduck (Tadorna tadorna) [A048]	The proposed Wind Farm Site is located approximately 8.3 km south of the SPA (closest straight-line distance).

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
	Teal (Anas crecca) [A052] Mallard (Anas platyrhynchos) [A053] Pintail (Anas acuta) [A054] Common Scoter (Melanitta nigra) [A065] Red-breasted Merganser (Mergus serrator) [A069] Oystercatcher (Haematopus ostralegus) [A130] Ringed Plover (Charadrius hiaticula) [A137] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Lapwing (Vanellus vanellus) [A142] Knot (Calidris canutus) [A143] Dunlin (Calidris alpina) [A149] Black-tailed Godwit (Limosa limosa) [A156] Bar-tailed Godwit (Limosa lapponica) [A157] Curlew (Numenius arquata) [A160] Redshank (Tringa totanus) [A162] Black-headed Gull (Chroicocephalus ridibundus) [A179] Common Gull (Larus canus) [A182] Herring Gull (Larus argentatus) [A184] Wetland and Waterbirds [A999] According to this SPA's site Conservation Objectives document: NPWS 19 July 2011, Conservation Objectives: Dundalk Bay SPA [004026]. Version 1.0, Arts, Heritage and the Gaeltacht, for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	A section of the Site drains to the Hammondstown Stream, which is within the River Dee catchment and enters the sea at Annagassan in Dundalk Bay. ~~The GCR is at a distance of approximately 11 km from the SPA, while the TDR is at a closest distance of approximately 8 km from the SPA~~ The GCR does not cross any watercourse that flows to Dundalk Bay. Part of the TDR crosses watercourses that are within the River Dee catchment. Hence, there is hydrological connectivity between the Project area and the SPA The ornithological assessment (EIAR Chapter 8) recorded frequently three SCIs within the proposed wind farm site, namely black-headed gull, common gull and herring gull, and concluded that there is connectivity between the SPA populations and the Development. Due to the absence or very low activity within and adjacent to the Development by other SCIs, all other species have been scoped out of the assessment.

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
		It is concluded that there is potential ornithological connectivity between the SPA and the site for the Proposed Development.
North-West Irish Sea SPA (site code: 004236)	Red-throated Diver (Gavia stellata) [A001] Great Northern Diver (Gavia immer) [A003] Fulmar (Fulmarus glacialis) [A009] Manx Shearwater (Puffinus puffinus) [A013] Cormorant (Phalacrocorax carbo) [A017] Shag (Phalacrocorax aristotelis) [A018] Common Scoter (Melanitta nigra) [A065] Little Gull (Larus minutus) [A177] Black-headed Gull (Chroicocephalus ridibundus) [A179] Common Gull (Larus canus) [A182] Lesser Black-backed Gull (Larus fuscus) [A183] Herring Gull (Larus argentatus) [A184] Great Black-backed Gull (Larus marinus) [A187] Kittiwake (Rissa tridactyla) [A188] Roseate Tern (Sterna dougallii) [A192] Common Tern (Sterna hirundo) [A193] Arctic Tern (Sterna paradisaea) [A194] Little Tern (Sterna albifrons) [A195] Guillemot (Uria aalge) [A199] Razorbill (Alca torda) [A200] Puffin (Fratercula arctica) [A204 According to this SPA's site Conservation Objectives document: NPWS 19 Sept 2023, Conservation Objectives: North-west Irish Sea SPA [004236[. Version 1.0, Department of Housing, Local Government and Heritage, for each of the listed SCIs, the Conservation Objective is to maintain the favourable	The Wind Farm Site is located approximately 6 km west of the SPA (closest straight-line distance). The GCR also is at a distance of approximately 6 km from the SPA, while the TDR is at a closest distance of approximately 9 km from the SPA The ornithological assessment (EIAR Chapter 8) recorded frequently three SCIs within the proposed wind farm site, namely black-head gull, common gull and herring gull, and concluded that there is connectivity between the SPA populations and the Development. Due to the absence or very low activity within and adjacent to the Development by other SCIs, all other species have been scoped out of the assessment. It is concluded that there is likely connectivity between the SPA and the site for the Proposed Development.

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
	conservation condition of the species for which the SPA has been selected.	
Boyne Estuary SPA (site code: 004080)	Shelduck (Tadorna tadorna) [A048] Oystercatcher (Haematopus ostralegus) [A130] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Lapwing (Vanellus vanellus) [A142] Knot (Calidris canutus) [A143] Sanderling (Calidris alba) [A144] Black-tailed Godwit (Limosa limosa) [A156] Redshank (Tringa totanus) [A162] Turnstone (Arenaria interpres) [A169] Little Tern (Sterna albifrons) [A195] Wetland and Waterbirds [A999] According to this SPA's site Conservation Objectives document: NPWS 26 Feb 2013, Conservation Objectives: Boyne Estuary SPA [004080]. Version 1.0, Arts, Heritage and the Gaeltacht, for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The site for the Proposed Development is located approximately 6.5 km northwest of the SPA (closest straight-line distance). The GCR and the TDR are at a closest distance of approximately 3.5 km from the SPA. The ornithological assessment (EIAR Chapter 8) recorded only two SCIs, lapwing and golden plover, within the Proposed Development site during baseline surveys but with very low frequency. Due to the absence of, or very low activity within and adjacent to the Development, all SCIs for this SPA have been scoped out of the assessment. It is concluded that there is no potential for the proposed Project to have effects on any of the SCIs of the SPA.
River Nanny Estuary and Shore SPA (site code: 004158)	Oystercatcher (Haematopus ostralegus) [A130] Ringed Plover (Charadrius hiaticula) [A137] Golden Plover (Pluvialis apricaria) [A140] Knot (Calidris canutus) [A143] Sanderling (Calidris alba) [A144] Herring Gull (Larus argentatus) [A184] Wetland and Waterbirds [A999	The site for the Proposed Development is approximately 12.3 km northwest of the SPA (closest straight-line distance). The GCR and TCR are at distances of approximately 9 km from the SPA.

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
	According to this SPA's site Conservation Objectives document: NPWS 21 Sept 2012, Conservation Objectives: River Nanny Estuary and Shore SPA [004158]. Version 1.0, Arts, Heritage and the Gaeltacht, for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The ornithological assessment (EIAR Chapter 8) recorded frequently one SCI within the proposed wind farm site, namely herring gull, and concluded that there is connectivity between the SPA population and the Development. Due to the absence or very low activity within and adjacent to the Development by other SCIs, all other species have been scoped out of the assessment. It is concluded that there is connectivity between the SPA and the site for the Proposed Development.
River Boyne and River Blackwater SPA (site code: 004232)	Kingfisher (Alcedo atthis) [A229] ~~According to the NPWS (2022) Conservation Objectives for River Boyne and River Blackwater SPA 004232. First Order Site-Specific Conservation Objective Version 1.0. Department of Housing, Local Government and Heritage, the Objectives are: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (as above)~~ According to this SPA's site Conservation Objectives document: NPWS 02 July 2024, Conservation Objectives: River Boyne and River Blackwater SPA [004232]. Version 1.0, Department of Housing, Local Government and Heritage, for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The site for the Proposed Development is approximately 7.6 km north-northeast of the SPA (closest straight-line distance). The GCR is at a distance of less than 500 m from the SPA, while the TDR crosses the eastern boundary of the SPA at the M1 bridge. While the route for the grid connection is close to the River Boyne, all stream crossings by the cable route are downstream of the SPA, i.e. east of M1 bridge, and hence could not

European Site	Reasons for designation (information correct as of 21st July 2025) (*denotes a priority habitat)	Distance from Project Area and summary of connectivity
		have impacts on the SPA. The TDR will merely pass the boundary of the SPA along the M1, with no works required at the M1 crossing. It is concluded that there is no potential for effects on the kingfisher population within the SPA as a result of the Project.

6.3.2.2 National designated sites

There are no Natural Heritage Areas (NHAs) within a 15 km radius of the Wind Farm Site.

Twenty proposed Natural Heritage Areas (pNHAs) occur within a 15 km radius of the Wind Farm Site (see **Figure 6.3** in Vol III and **Table 6.3**).

Eleven of the pNHAs are also designated as SACs and/or SPAs, namely:

- Stabannan-Braganstown pNHA
- Dundalk Bay pNHA
- Clogher Head pNHA
- Boyne Coast and Estuary pNHA
- Laytown Dunes/Nanny Estuary pNHA
- Boyne Woods pNHA (part of River Boyne and River Blackwater SAC)
- Crewbane Marsh pNHA (part of River Boyne and River Blackwater SAC)
- Rossnaree Riverbank pNHA (part of River Boyne and River Blackwater SAC)
- Dowth Wetland pNHA (part of River Boyne and River Blackwater SAC)
- King William's Glen pNHA (part of River Boyne and River Blackwater SAC)
- Boyne River Islands pNHA (part of River Boyne and River Blackwater SAC)

Potential impacts on these sites are discussed in detail in the accompanying AA Screening Report and NIS.

Details of the remaining nine listed pNHA sites are listed in **Table 6.3**.

Table 6.3: Relevant proposed Natural Heritage Area sites, reasons for designation (as known), approximate distances from subject Site and summary of connectivity.

Site	Reasons for designation (information correct as of 2nd October 2024)	Distance from proposed Project and Summary of Connectivity
	PROPOSED NATURAL HERITAGE AREAS	
Barmeath Woods pNHA (site code 001293)	Not listed but comprises stands of mature broadleaved woodland.	The pNHA is located approximately 3 km to the north of the northernmost part of the proposed Wind Farm Site. There is no ecological or hydrological connectivity between the two locations or with any part of the Grid Connection Route (GCR) or the Turbine Delivery Route (TDR).
Dunany Point pNHA (site code 001856)	Not listed, but comprises a headland marking southern tip of Dundalk Bay of geomorphological and ecological interest.	The pNHA is located approximately 11 km to the northeast of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Blackhall Woods pNHA (site code 001293)	Not listed, but comprises demesne type broadleaved woodland of ash, chestnut and beech.	The pNHA is located approximately 2.5 km to east of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Castlecoo Hill pNHA (site code 001458)	Not listed, but an example of a rocky outcrop with heath vegetation	The pNHA is located approximately 5 km to the east of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Duleek Commons pNHA (site code 001578)	Not listed but comprises marsh and calcareous fen with some rare plants.	The pNHA is located approximately 14 km to the south-southwest of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.

Site	Reasons for designation (information correct as of 2nd October 2024)	Distance from proposed Project and Summary of Connectivity
Mellifont Abbey Woods pNHA (site code 001464)	Not listed but an extensive complex of broadleaved woodland and lakes with associated flora and fauna.	The pNHA is located approximately 7 km to the west of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Kildemock Marsh pNHA (site code 001806)	Not listed but comprises a marsh.	The pNHA is located approximately 11 km to the northwest of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Ardee Cutaway Bog pNHA (code 001454)	Not listed but a cutaway raised bog.	The pNHA is located approximately 14 km to the northwest of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.
Louth Hall and Ardee Woods pNHA (code 001616)	Not listed, but comprises a stand of demesne type broadleaved woodland.	The pNHA is located approximately 13 km to the northwest of the proposed wind farm site. There is no ecological or hydrological connectivity between the two locations or with any part of the GCR or the TDR.

6.3.3 Habitats, Vegetation and Flora

As already noted, the site for the Proposed Development is largely active farmland and commercial forestry, with the dominant habitats within the study area for the Wind Farm being improved agricultural grassland (GA1), arable land (BC1), and conifer plantation (WD4). The fields are mostly bounded by Hedgerows (WL1), Treelines (WL2) or woodland edge. Scrub (WS1), usually gorse or blackthorn, is a feature of the Site. Ecologically, the feature of highest value is the Drumshallon Lough wetland system, which comprises a mesotrophic lake (FL4) associated with wet woodland (WN6), Wet grassland (GS4), Marsh

(GM1) and a small area of Transition mire (PF3) (latter Annex I listed habitat). Two stands of mature Broadleaved woodland (WD1) occur on site and are of ecological note. Grassland which is managed at a low intensity (classified as Neutral grassland GS1) is present on site, along with a small Gravel/sand quarry (ED1) and some other Disturbed (ED) habitats. The watercourses within the study site are described in detail in **Chapter 9: Aquatic Ecology**.

There follows a general description of the habitats within the redline boundary and then a summary of the principal habitat(s) at each turbine location as well as at the other main infrastructure locations (met mast, substation, etc.). Habitat descriptions for the Grid Connection route and the relevant sections of the Turbine Delivery Route are given separately. Principal habitats are mapped in **Figure 6.4.**

6.3.3.1 Mesotrophic lakes (FL4)

Drumshallon Lough is considered to be a mesotrophic system. It is a relatively small waterbody (0.33 ha), which lies within the Burren_SC_010 WFD river sub-catchment (see **Chapter 11: section 11.4.6** for details).

The lake supports an aquatic flora, with pondweeds (*Potamogeton* spp.) and yellow water-lily *Nuphar lutea* observed from lake edge. The marginal vegetation is dominated by a fringe of common club-rush *Schoenoplectus lacustris*, along with bulrush *Typha latifolia* and yellow iris *Iris pseudacorus*. Willows (*Salix* spp.) and alder *Alnus glutinosa* occur along and above the lake shore.

Plate 6.1 View of Drumshallon Lough looking north-eastwards. Much of northern shore is backed by a fringe of common club-rush and then a strip of woodland. Some marsh and transition mire occur along south shore. (June 2023).

6.3.3.2 Watercourses (FW2)

The watercourses within the study area are described in detail in **Chapter 9: Aquatic Ecology** and **Chapter 11: Hydrology & Hydrogeology**. The Drumshallon Lough Stream flows in an eastwards direction and joins with the Piperstown Stream (which occurs just south of the Piperstown Livery and Equestrian Centre) to form the Termonfeckin Stream, which enters the sea approximately 8.5 km downstream of the site at Termonfeckin beach. The Slieveboy Stream flows from the Kilsaran Quarry complex through the northernmost part of site and continues in a northeast direction to reach the sea at Lurganboy. A further watercourse, the Hammondstown Stream, occurs just to the west of the site. These are all relatively minor watercourses.

The watercourses on site are classified as Depositing/lowland rivers (FW2).

6.3.3.3 Improved agricultural grassland (GA1)

Improved agricultural grassland within the study area is generally managed intensively, with signs of fertiliser usage and periodic reseeding. Widespread grass species include common bent *Agrostis capillaris*, perennial rye grass *Lolium perenne,* and meadow grass (*Poa* spp.), along with other species such as Yorkshire fog *Holcus lanatus*, and sweet vernal grass

Anthoxanthus odoratum. Herbaceous species present include white clover *Trifolium repens*, meadow buttercup *Ranunculus acris,* creeping buttercup *Ranunculus repens,* ribwort plantain *Plantago lanceolata*, common mouse-ear *Cerastium fontanum,* daisy *Bellis perennis,* self-heal *Prunella vulgaris*, and dandelion *Taraxacum officinale* along with coarser species including creeping thistle *Cirisum arvense,* docks (*Rumex spp.)* and nettles *Urtica dioica.* Rushes, mainly soft rush *Juncus effusus*, have a presence in some fields though are nowhere frequent. The fields appear to be used mainly for stock, with cattle present at time of survey.

Plate 6.2: Improved grassland is a widespread habitat within the study area - view is at the location for proposed Turbine T02, looking westwards. (December 2024).

6.3.3.4 Neutral grassland (GS1)

There is one area of unimproved or semi-improved grassland which is considered best classified as Neutral grassland. This is the large field which slopes down towards Drumshallon Lough (used for rough grazing), and here there is occasional exposed rock as well as a small disused rock quarry (see **Figure 6.4**).

Species present include grass species such as *Deschampsia flexuosa*, *Holcus lanatus, Agrostis stolonifera* and *Dactylis glomerata*. Broadleaved herbs include white clover *Trifolium repens,* red clover *Trifolium pratense*, narrow leaved-plantain *Plantago lanceolata*, meadow buttercup *Ranunculus acris*, meadow vetchling *Lathyrus pratensis*, silverweed

Potentilla anserina, yarrow *Achillea millefolium*, common knapweed *Centaurea nigra*, meadowsweet *Filipendula ulmaria,* cat's-ear *Hypochoeris radicata*, and bird's-foot trefoil *Lotus corniculatus.* Coarser species, such as thistles (*Cirsium spp.),* docks (*Rumex spp.*), ragwort *Jacobea vulgaris* and nettle *Urtica dioica*, are also present in the sward.

Plate 6.3: Neutral grassland is represented in the field which slopes towards Drumshallon Lough (route of track between Turbines T03 & T05). Very low intensity management occurs here. Looking north-westwards. (June 2023).

6.3.3.5 Wet grassland (GS4)

Wet grassland occurs mainly in the low-lying areas of the field which slopes towards Drumshallon Lough but is also represented in part of the northernmost field and as patches elsewhere (see **Figure 6.4**).

Soft rush *Juncus effusus* is frequent, along with *Juncus articulatus,* creeping bent *Agrostis stolonifera* and small sedges such as *Carex flacca*. Herbaceous species include creeping buttercup *Ranunculus repens*, marsh thistle *Cirsium palustre*, silverweed *Potentilla anserina*, cuckoo flower *Cardamine pratensis*, meadow sweet *Filipendula ulmaria*, and tormentil *Potentilla erecta*. In wetter areas, water mint *Mentha aquatica,* lesser spearwort *Ranunculus flammula*, and yellow iris *Iris pseudacorus* are found.

6.3.3.6 Marsh (GM1) / Transition mire (PB3)

A mosaic of marsh and transition mire, along with wet grassland, occurs along the southern and western margins of Drumshallon Lough and continues further to the west. This entire area is wet, with standing water in places as well as localised quaking patches.

Marsh species recorded include water mint *Mentha aquatica,* lesser spearwort *Ranunculus flammula*, marsh thistle *Cirsium palustre*, marsh pennywort *Hydrocotyle vulgaris,* marsh cinquefoil *Comarum palustris*, ragged robin *Lychnis flos-cuculi*, yellow iris *Iris pseudacorus*, spotted orchid *Dactylorhiza maculata*, silverweed *Potentilla anserina,* marsh bedstraw *Galium palustre,* devil's-bit scabious *Succisa pratensis*, marsh willowherb *Epilobium palustre*, purple loosestrife *Lythrum salicaria* and horsetails (*Equisetum fluviatile, E. palustre*). Grass of parnassus *Parnassia palustris* is localised. The rushes *Juncus effusus*, *J. acutiflorus* and *J. articulatus* are frequent, along with creeping bent *Agrostis stolonifera*.

The quaking bog areas also support bog cotton *Eriophorum angustifolium*, various small sedge species (*Carex* spp.), bogbean *Menyanthes trifoliata*, marsh pennywort *Hydrocotyle vulgaris*, lesser spearwort *Ranunculus flammula*, along with frequent marsh cinquefoil (see **Plate 6.5**). Bryophyte cover is well developed in parts, including bog mosses (*Sphagnum* spp.) and brown mosses (*Calliergon* spp.).

Plate 6.4: View westwards over area of marsh, wet grassland and transition mire which occurs west of Drumshallon Lough. A stone wall demarcates the south boundary of the area. (June 2023).

Plate 6.5: The transition mire is characterised by species such as bogbean and common bog cotton. (June 2023).

6.3.3.7 Wet willow-alder-ash woodland (WN6)

A small stand of willow (*Salix* spp.) and alder *Alnus glutinosa* dominated woodland occurs along the northern shore of Drumshallon Lough. Also present is some ash *Fraxinus excelsior* and birch *Betula pubescens*. (see **Plate 6.1**).

6.3.3.8 Broadleaved woodland (WD1)

Stands of mature broadleaved woodland (WD1) occur at the following locations within the study area (see **Figure 6.4**):

The entrance driveway to the Piperstown Livery and Equestrian Centre – here beech *Fagus sylvatica* and ash are the dominant species with some sycamore *Acer pseudoplatanus,* oak (*Quercus petraea/robur*) and horse chestnut *Aesculum hippocastanum*. The invasive cherry laurel *Prunus laurocerasus* is frequent in parts.

To the east of the location for the proposed substation – this stand is also dominated by beech and ash but includes some mature pines (*Pinus* spp.).

To the north of the conifer plantation where Turbine T05 would be located: this is a large strip of woodland which broadens at the western end (see **Plate 6.6**). Beech, ash, sycamore and oak are the dominant species. The wood, which is demarcated by a stone wall and bank along its northern margin, has a very open character.

Plate 6.6: View of strip of mature broadleaved woodland which occurs north of the conifer plantation where Turbine T05 is proposed to be located. Looking westwards from field to north. (June 2023).

6.3.3.9 Coniferous plantation (WD4)

Conifer plantation is a principal habitat within the study area and occurs in the southern and northwestern sectors of the site (see **Figure 6.4 & Plate 6.7**).

The main commercial tree species are Norway spruce *Picea abies* and sitka spruce *Picea sitchensis,* along with some Japanese larch *Larix kaempferi.* Some broadleaved trees, mainly sycamore, have been planted along the margins of the conifer blocks.

The plantations are now in the closed canopy stage and appear of good quality in terms of growth (see details in Forestry Report **Appendix 2.2**).

Generally, the ground layer is species-poor, being dominated by conifer needles along with occasional clumps of mosses such as *Hypnum jutlandicum, Rhytidiadelphus loreus, Thuidium tamariscinum* and *Plagiothecium undulatum.* Vascular plant species have a very low cover, with bramble *Rubus fruticosus* and broad buckler fern *Dryopteris dilatata* the most widespread species.

Plate 6.7: Conifer plantation is a principal habitat within the study area. Norway spruce is the principal tree species, with larch and sycamore along the margins. View is looking towards location for proposed Turbine T05. (December 2023).

6.3.3.10 Scrub (WS1)

Scrub is a feature of the site and especially in the central and northern sectors (see **Figure 6.4**). Common gorse *Ulex europaeus* and blackthorn *Prunus spinosa* are the main species, with some hawthorn and bramble *Rubus fruticosus* and occasional elder *Sambucus nigrum*. The scrub is often impenetrable, such as on the slopes above Drumshallon Lough (see **Plate 6.8**).

Plate 6.8: View looking northwards towards area of sloped ground dominated by dense scrub and location for proposed Turbine T03. Also shown in mid area of image is a strip of wet grassland dominated by yellow iris. (June 2023).

6.3.3.11 Hedgerows (WL1) and Treelines (WL2)

Hedgerows form the field boundaries throughout much of the study site. These are generally well managed and of low to moderate height (c.3 m to 7 m), with occasional taller sections (see **Plates 6.9 - 6.11**).

The main tree/shrub species are hawthorn *Crataegus monogyna,* blackthorn *Prunus spinosa,* ash *Fraxinus excelsior* and gorse. Other species present include sycamore *Acer pseudoplatanus*, hazel *Corylus avellana,* grey willow *Salix cinerea* subsp. *oleifolia,* holly *Ilex aquifolium*, and elder *Sambucus nigra.* Many of the ash trees, which comprise the principal tree standard, are affected by ash dieback disease.

Bramble is a common component of the understorey and ground layers, with wild roses (*Rosa* spp.) and honeysuckle *Lonicera periclymenum* also represented. Ivy *Hedera helix* is often frequent on the larger trees.

Herbaceous species occurring within the ground layer include hogweed *Heracleum sphondylium*, broadleaved dock *Rumex obtusifolius*, nettle *Urtica dioica,* bush vetch *Vicia*

sepium, cleavers *Galium aparine*, primrose *Primula vulgaris* and lords and ladies *Arum maculata*.

The hedgerows are typically laid on clay banks and are usually associated with a drainage ditch (as part of field boundary).

Treelines are not a particular feature of the area, though sections of the broadleaved woodland stands could be classified also as treelines. Treelines often occur the margins of the conifer plantations, such as along the boundary with Kilsaran quarry.

Plate 6.9: Some of the hedgerows on site are maintained at a low height (c.2 m), such as along the track to northeast of Turbine T04. (December 2023).

Plate 6.10: View of moderately sized hedge (c.5-6 m) along east boundary of field where substation is proposed. Hawthorn and ash are the principal tree species. This adjoins a stand of broadleaved woodland to north. (December 2023).

Plate 6.11: View of well-developed hedgerow/treeline, which will be breached by access track from northernmost part of site. (December 2023).

6.3.3.12 Spoil and bare ground (ED2) / Recolonising bare ground (ED3)

Some relatively recently disturbed ground occurs in the southern sector of the site (see **Plate 6.12**). There is still some bare soil (spoil heaps *etc*.) but much of it is now vegetated with an ephemeral vegetation including such species as fireweed (*Epilobium* spp.), colt's foot *Tussilago farfara,* rushes and bramble. Gorse scrub is also becoming established locally.

Plate 6.12: View of disturbed ground in area of location for proposed Turbine T05, looking northwards towards conifer plantation stand. The alien invasive species Japanese knotweed and Himalayan balsam were found in a ditch towards right of image during the aquatic ecology survey (June 2023).

6.3.3.13 Arable land (BC1)

Arable farming is practiced within the site. This is at an intensive scale and the only flora is along field edges, including such species as common poppy *Papaver rhoeas*, field speedwell *Veronica persica*, fumitory (*Fumaria* spp.) and knotgrasses (*Polygonum* spp.).

6.3.3.14 Stone walls (BL1)

Stone walls from the boundaries to some of the fields. These vary from low walls (see **Plate 6.13**) to substantial features, such as the wall around virtually the entire field which occurs south of Drumshallon Lough and associated wetland (see **Plate 6.5**).

Plate 6.13: Some of the fields on site are bounded by low stone walls. View is looking northwards over location for Turbine T04. (December 2023).

Table 6.4: Summary of the main habitat(s) occurring at turbine and other infrastructure component locations.

Location	Main habitat(s) present
AT01	Conifer plantation (WD4)
AT02	Improved grassland (GA1)
AT03	Scrub (WS1)
AT04	Improved grassland (GA1)/Arable land (BC1)
AT05	Conifer plantation (WD4)/ Disturbed ground (ED2/ED3)/ Scrub (WS1)/ Wet grassland (GS4)
Substation & temporary compound no. 3	Improved grassland (GA1)
Battery Energy Storage System	Improved grassland (GA1)
Temp. compound no. 1	Arable land (BC1)
Temp. compound no. 2	Improved grassland (GA1)
Met Mast 1	Arable land (BC1)

6.3.3.15 Invasive species

During the field surveys, a search for Invasive Alien Plant Species (IAS) was carried out.

The main regulations influencing Ireland's invasive species lists are:

- the Third Schedule list of the European Communities (Birds and Natural Habitats) Regulations 2011-2021;
- the Invasive Alien Species of Union concern listed under the EU IAS Regulation [1143/2014].

Two species were recorded during the Aquatic Ecology Survey in June 2023 and their presence confirmed in September 2024 (see **Figure 6.5**), as follows:

Japanese knotweed *Fallopia japonica*
Himalayan or Indian balsam *Impatiens glandulifera*

The two species were recorded in close proximity to the location of disturbed ground in the southern sector of the site and also along the local road to the east (L2275) ~~at the entrance to a private road here access to the met mast is proposed~~ (see **Chapter 9: Aquatic Ecology)**.

At the first mentioned site, the origin of the plants would appear to have been associated with spoil or garden waste deposition, with other widespread alien species also present including *Montbretia* (*Crocosmia x crocosmiiflora*), butterfly bush *Buddleja davidii* and *Cordyline australis.*

In September 2024, the Japanese knotweed comprised one significant clump within the Site along the edge of the forest and overgrown hedge/ditch immediately north of the proposed road leading from Turbine T05 towards the substation (see **Plate 6.14**). At the location at the junction of the local L2275 road and the private road (latter within the redline boundary), ~~track leading towards the proposed mast~~ , there was a very extensive strip of the plant, part of which had been cut back just before the time of survey (see **Plate 6.15**).

In September 2024, Himalayan balsam was widely distributed along the edge of the forest tracks alongside the conifer plantation at the location for Turbine T05 (see **Plate 6.16**). It was also widespread in the ditch on the northern side of a section of the private road off the L2275 (within the redline boundary)~~track leading to the proposed mast location..~~ Several sightings of this invasive species were also made further north along the local road L2275.

Plate 6.14: Stand of Japanese knotweed near proposed Turbine T05 location. (September 2024).

Plate 6.15: An extensive stand of Japanese knotweed occurs on local road L2275 ~~at entrance to private road leading to location for proposed mast~~ – this had been partly cut in recent days. Looking northwards, September 2024. This part of the site is no longer being

used as a site entrance however the stand of Japanese knotweed is in immediate proximity to the redline boundary.

Plate 6.16: Himalayan or Indian balsam is widespread at the location for proposed Turbine 05. (September 2024).

6.3.3.16 Protected flora

In order to determine if any legally protected plant species have been previously recorded from within the development footprint of the Proposed Development and adjoining areas, a search was made of the online NPWS Flora (Protection) Order 2022 Map Viewer and the Botanical Society of Britain and Ireland (BSBI) online plant distribution Atlas (https://bsbi.org/maps). Information from these sources was accessed on the 18th of September 2024. The searches reveal that there are no records from the 10 km x 10 km square O 08 for species listed in the 2022 Flora Protection Order (Government of Ireland 2022).

The main habitats within the wind farm development footprint are improved grassland and conifer plantation, which generally do not provide suitable habitat for rare or protected plant species, and no such species were recorded during the baseline surveys.

Table 6.5 below outlines previous records for rare and protected plant species which have been noted in the adjoining 10 kilometre squares, along with comments regarding the likelihood of presence within the Proposed Development site.

Table 6.5: Rare/protected plant species which have been recorded within the 10 km squares adjoining O 08, along with comments regarding their possible occurrence within the Proposed Development site.

Species	Occurrence in relation to the Proposed Development site	Comments
Hordeum secalinum (Meadow barley)	This species has been recorded from areas of wet grassland along the River Boyne in the past. The most recent record was recorded in 1991, just east of Slane, c. 14 km to the south-east of Proposed Development site.	The species is largely confined to areas of natural grassland, especially along larger rivers which are subject to regular annual flooding. The potential for the species to occur within the survey area is considered to be low due to the lack of suitable habitat.
Juncus compressus (Round fruited rush)	The closest known site for this rare rush species is the banks of the river Boyne between Slane and Drogheda, c. 14 km to the south-west of the Proposed Development site.	A species confined to wet grassland areas subject to flooding. The potential for the species to occur within the survey is very low due to the lack of suitable habitat.
Galeopsis angustifolia (Red deadnettle)	There are old records, dating from the 1890's, of this species from the Laytown/Drogheda area which is located c. 10 km to the south-east of the Proposed Development site.	There have been no post-1900 records of this species from Co. Louth. The species is generally restricted to disturbed habitats with a high cover of bare soil.
Omalotheca sylvatica (Heath cudweed)	This species has been previously recorded from Slieve Breagh, located 14 km west of the survey area, but has not been seen there since the early 1900s	Potential for the species to occur within the survey area is very low given the current very restricted distribution of the species in Ireland.
Scleranthus annuus (Annual knawweed)	Previously recorded in the early 1900s from Tiernan's Hill near Collon, c. 10 km to the west of the survey area. Has not been recorded since.	This annual weedy species has not been recorded from the north Leinster area since 2000 and the potential for occurrence in the survey is very low.

6.3.3.17 Grid Connection Route corridor

The route of the proposed Grid Connection from the 110kV Substation Drybridge (just off junction 10 of M1 motorway) is detailed in the technical report by TLI (**Appendix 2.3**).

The total length is 12,650 m, with 900 m within the wind farm site, 350 m on private land and 11,400 m along public roads.

The route will cross the M1 and 5 no. watercourses using HDD method.

The route follows the regional R132 road and various local roads. All of the roads are characterised by ribbon residences, farm complexes and some commercial premises.
The regional road generally has wide grassy verges to both sides and is lined with hedgerows and treelines (see **Plate 6.17**). Ash and sycamore, with beech to a lesser extent, are the principal tall tree species. The main hedge forming species are hawthorn, blackthorn, and elder.

As with the regional road, the local roads have grassy verges though these are often narrow (<1 m). The verges are generally dominated by grassy vegetation with cock's-foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus* dominating. Other frequent species in the grassy vegetation include common nettle *Urtica dioica*, meadowsweet *Filipendula ulmaria*, wild angelica *Angelica sylvestris* and creeping buttercup *Ranunculus repens*.

The hedging along the local roads is mostly maintained at a low level 3-4 m (see **Plate 6.18**) but with taller trees locally and especially at residences and farm entrances. Hawthorn, blackthorn, and ash are the main species, with a scattering of sycamore, willows, holly, hazel and elder. Brambles *Rubus fruticosus* are frequent within the hedge bases, along with ivy *Hedera helix*.

Plate 6.17: The grid connection route follows the R132 regional road for 2.6 km. The road is lined by grassy verges and then treelines and/or hedgerows. Looking northwards. (September 2024).

Plate 6.18: Much of the grid connection route is along local roads. These are typically lined by grass verges and low hedgerows – looking eastwards along the L2308. (September 2024).

6.3.3.18 Turbine Delivery Route

It is proposed that the Turbine Delivery Route will be from Galway Port, following various national routes and eventually linking into the M1 and the regional roads R169 and R132. Full details are presented in **Chapter 2: section 2.6.6**.

Temporary works are required at 1~~36~~locations along the route. These works will be relatively minor in nature, for example removal of street furniture and signage, and none involve works at watercourse crossings. Hedgerow removal and trimming will be required at only one location (no. ~~1~~6, at R336 / N6 Junction ~~Mullary Cross~~ – see EIAR **Chapter 2: Table 2.7**). The hedging here is ~~low~~ medium to high in height (~~<2~~ c.4-10 m) and dominated by ~~hawthorn,~~ elder and ash (see **Plate 6.19**).

Plate 6.19: View looking northeast towards section of hedgerow along the R336 (location no. 6), which will required to be removed to facilitate the transport vehicles. This is a medium to high hedge dominated by elder and ash. (July 2025).

~~**Plate 6.19:** View looking northeast towards section of hedgerow along the R132 (location no. 16), which will required to be removed to facilitate the transport vehicles. This is a low hedge dominated by hawthorn, elder and ash. (September 2024).~~

6.3.4 Terrestrial Mammals, Amphibians and Reptiles

The Irish hare *Lepus timidus hibernicus* was recorded within the Wind Farm study area and was observed at several locations in grassland fields. Rabbit *Oryctolagus cuniculus* was present throughout the site though was nowhere frequent.

The red fox *Vulpes vulpes* is widespread, with observations and signs recorded throughout the site for the proposed wind farm. The habitats within the site are suitable for various ubiquitous small mammal species, including pygmy shrew *Sorex minutus,* hedgehog *Erinaceus europaeus* (fresh road casualty approaching entrance to Piperstown Livery and Equestrian Centre on 22nd June 2023), field mouse *Apodemus sylvatica* and brown rat *Rattus norvegicus* (two dead rats along margin of field to north of Kilsaran quarry in December 2023).

Much of the wind farm study site provides good habitat for badger *Meles meles*. Extensive feeding marks and one latrine were observed along the edge of a small stand of broadleaved woodland to the east of the location for proposed substation on 12th December 2023 (see **Figure 6.6)**. However, despite extensive search of the woodland stand, no evidence of setts was found. Feeding badgers travel widely and setts may exist in the woodland stand

further to the east or south of the entrance of the Equestrian School or indeed elsewhere in the area. A dead adult badger was observed on the local road c.300 m west of the entrance to the Kilsaran Quarry facility on 22nd February 2024.

Red squirrel *Sciurius vulgaris* was observed in the conifer plantation at Turbine T05 location, which has a good margin of broadleaved trees, on 22nd February 2024 (see **Figure 6.6**). The general mix of broadleaved and conifer stands within the study area provides excellent habitat for red squirrel. The Irish stoat *Mustela erminea*, while not recorded during the various surveys, is a widely distributed species and can be expected within the hedgerow and stonewall habitats within the Site. Similarly, pine marten *Martes martes*, is now a widespread species in eastern Ireland and could be expected within the wooded areas of the site. Both Irish stoat and pine marten have been recorded from the 10 km survey square O08 (in which the Site is located).

No signs of otter *Lutra lutra* presence were recorded on any of the watercourses surveyed during the terrestrial ecology field surveys. However, the aquatic ecology survey (see **Chapter 9**) recorded possible otter spraints on the downstream section of the Drumshallon Lough Stream (see **Figure 6.6**) and on the Hammondstown Stream (west of Site) in June 2023. These are small watercourses with the banks difficult to view due to overhanging vegetation. While the streams, as well as Drumshallon Lough itself, provide feeding potential (including small fish) for otter, the prospect of a breeding site (holt) on these streams is considered low due to their small size and low water flow.

The common frog *Rana temporaria* was recorded in the wetland adjoining Drumshallon Lough and may occur in drains elsewhere on site.

While the presence of the smooth newt *Lissotriton vulgaris* at Drumshallon Lough cannot be ruled out, the preferred habitat for the species is smaller ponds, which are not represented on Site, and the species was not recorded in any of the baseline surveys.

A single common lizard *Zootoco vivipara* was observed on some open dry ground amongst scrub north of Drumshallon Lough (near Turbine T03 location) on 21st June 2023.

6.3.5 Marsh Fritillary

While *Succissa pratensis* (foodplant of marsh fritillary) was a component of the wet grassland/marsh within the wetland complex at Drumshallon Lough, the distribution was localized and patchy and nowhere was the species abundant (i.e. >3 plants per square

metre). Generally, the area may be too wet (*i.e.* water table at surface) and the vegetation too high for favourable conditions for marsh fritillary.

Taking into account the criteria for density of devil's-bit scabious were generally not achieved (see **section 6.2.7.3**), it was considered that further survey for this species was not merited.

Elsewhere on site the presence of devil's-bit scabious is only occasional.

6.3.6 Summary of Ecological Receptors and Conservation Value of Project Area

6.3.6.1 Habitats, vegetation and flora

The Wind Farm Site is dominated by improved agricultural grassland, arable land and conifer plantation - these are widespread habitats throughout the island of Ireland and are rated as of Negligible to, at most, Local Importance (lower value).

Also rated of Negligible Importance is the disturbed ground (ED) habitats, with the scattered areas of rush dominated wet grassland, the areas of gorse dominated scrub, and the stone walls rated as Local Importance (lower value).

The stands of broadleaved woodland, the hedgerows and the treelines, along with the mixed scrub areas (*i.e.* not uniform gorse but rather a mix with blackthorn and hawthorn), are rated as of Local Importance (higher value).

By far the area of most ecological interest is the Drumshallon Lough wetland complex, comprising lake, marginal swamp vegetation, wet woodland, wet grassland, marsh and transition mire. This is a semi-natural to natural wetland system and supports an associated diverse flora and fauna (including breeding snipe). In particular, transition mire is listed on Annex I of the EU Habitats Directive (Transition mires and quaking bog, code: 7140). In the latest report on the conservation status of the Annex I habitats in Ireland (The Status of EU Protected Habitats and Species in Ireland, NPWS 2019), the overall conservation status assessment for Transition mires nationally is Bad but with a Stable trend. The Report notes the following "*this habitat is widespread but localised in Ireland. It has been recorded most frequently in blanket bog regions in the north and west, limestone regions in the northwest and midlands, and in inter-drumlin hollows and lakes in the border counties. The main pressures facing transition mires in Ireland are afforestation, water pollution, drainage and hydrological changes. Grazing/agricultural management is also prominent as an issue*." At

the Drumshallon site, the conservation status and the functionality of the habitat is considered generally good, with occasional grazing/wallowing by cattle the main threat.

Drumshallon Lough was surveyed by Foss *et al.* (2012) in the Louth Wetland Survey. It was labelled as site no. LH119 (name incorrectly given as Drumshalbon Lough). Due to the presence of transition mire, a rating of C+ County Conservation value was given to the site. Subsequently, the site was given a B National Importance rating (see Wetland Survey Ireland, Map of Irish Wetlands, wwwWetlandSurveysIreland.com, last update 3rd June 2024). In the present assessment, the wetland complex is rated as of National Importance. No nationally rare or legally protected plant species listed in the 2022 Flora (Protection) Order were recorded from within the Wind Farm Site during the surveys nor are there any past records of such species from the study area.

6.3.6.2 Terrestrial mammals, amphibians and reptiles

The Wind Farm Site supports a typical mammalian fauna of mixed agricultural land and coniferous plantation.

The Irish hare, badger and red squirrel are protected under the Wildlife Acts, as are other expected species on site such as pygmy shrew, hedgehog and Irish stoat.

While the watercourses within the Wind Farm Site are considered too small to support breeding otter, the Drumshallon Lough Stream as well as the lake itself are expected to attract feeding otter (with evidence of presence through spraints). Otter is listed on Annex II of the EU Habitats Directive as amended.

All mammal species recorded within the Wind Farm Site, or expected to occur, are listed as 'Least Concern' on the Irish Red List (Marnell *et al*. 2019).

The common frog and the common lizard are protected under the Wildlife Acts, though both are listed as 'Least Concern' on the Irish Red List (King *et al*. 2011).

6.4 ASSESSMENT OF POTENTIAL EFFECTS

6.4.1 The 'Do-Nothing' Impact

Without the proposed Wind Farm proceeding, it is expected that the existing land-uses within the area of the Wind Farm Site, namely agriculture and forestry, will continue. As the conifer plantations mature, they will be harvested and replanted. Further forestry may also be planted. The Drumshallon Lough wetland system could possibly be affected by future summer grazing

in the wet grassland/marsh areas (which could be improved for agriculture by draining) and/or by the further spread of scrub in the area.

Overall, in the absence of the Proposed Development, the ecology of the Wind Farm Site would be expected to remain fairly similar as at present.

6.4.2 Potential Impacts on European Conservation Sites

The AA Screening report that accompanies this planning application has shown objectively that in the absence of mitigation, likely or possible significant effects on four of the European sites (as listed in **Table 6.2**) could not be excluded during the construction, operational and/or decommissioning stages of the Proposed Development. These are:

- Boyne Coast and Estuary SAC (code 001957)
- River Boyne and River Blackwater SAC (code 002299)
- Dundalk Bay SAC (code 000455)
- Dundalk Bay SPA (code 004026)

For these sites, it is considered that the competent authority should carry out an Appropriate Assessment (AA) in respect of the Proposed Development. A Natura Impact Statement has been prepared to assist with the AA.

For four sites within the identified zone of influence, no pathway was identified between the site for the proposed Project (Source), including the Grid Connection Route and the Turbine Delivery Route, and the relevant European site (Receptor). These four sites are

- Clogher Head SAC (code 001459)
- Stabannon-Braganstown SPA (code 004091)
- Boyne Estuary SPA (code 004080)
- River Boyne and River Blackwater SPA (code 004232)

For a further two SPA sites, while connectivity was identified (by way of gull species) between the proposed Project area and the relevant SPA, it was concluded that the effects on the SCIs as a result of the Project (in absence of mitigation) would be Not Significant and that further assessment on these SPAs is not required. The two sites are:

- North-West Irish Sea SPA (code 004236)
- River Nanny Estuary and Shore SPA (code 004158)

Therefore, it is concluded beyond reasonable scientific doubt, and in view of the best available scientific knowledge, that there is no potential for likely significant effects on the

qualifying interests or the Special Conservation Interests of the above listed seven sites as a result of the proposed Project when considered alone or in combination with other plans and projects.

6.4.3 Potential Impacts on National Conservation Sites

6.4.3.1 Natural Heritage Areas

As noted, there are no Natural Heritage Areas (NHAs) within the zone of influence of the Proposed Wind Farm Development.

6.4.3.2 Proposed Natural Heritage Areas

As noted in **section 6.3.2.2**, there is a total of 20 proposed Natural Heritage Areas (pNHAs) within a radius of 15 km of the Proposed Wind Farm Site (see **Figure 6.4** and **Table 6.3**). Eleven of the pNHAs are also designated as SACs and/or SPAs, namely:

- Stabannan-Braganstown pNHA
- Dundalk Bay pNHA
- Clogher Head pNHA
- Boyne Coast and Estuary pNHA
- Laytown Dunes/Nanny Estuary pNHA
- Boyne Woods pNHA (part of River Boyne and River Blackwater SAC)
- Crewbane Marsh pNHA (part of River Boyne and River Blackwater SAC)
- Rossnaree Riverbank pNHA (part of River Boyne and River Blackwater SAC)
- Dowth Wetland pNHA (part of River Boyne and River Blackwater SAC)
- King William's Glen pNHA (part of River Boyne and River Blackwater SAC)
- Boyne River Islands pNHA (part of River Boyne and River Blackwater SAC)

Potential impacts on these 11 sites are referred to in **Section 6.4.2** above and are assessed in detail in the accompanying AA Screening Report and NIS.

Details of the remaining nine listed pNHA sites are listed in **Table 6.3**. For these sites, there is no ecological or hydrological connectivity with the Wind Farm Site or with the Grid Connection Route or the Turbine Delivery Route.

As there is no potential for impacts on these nine sites as a result of the Proposed Development, further consideration of these sites is not required.

6.4.4 Construction Phase Impacts on Habitats, Vegetation and Flora

The construction of the Proposed Development will result in the following impacts on terrestrial habitats and flora:

- permanent loss of habitat
- temporary loss of habitat
- disturbance to habitats
- changes to existing habitats

In addition, works involving the removal of hedging will be required along one part of the Turbine Delivery Route to facilitate large transport vehicles. Tree pruning may also be required along various sections.

6.4.4.1 Permanent loss of habitat

The permanent loss of habitat at the Wind Farm Site, *i.e.* habitat which will be replaced by wind farm infrastructure including turbine foundations and hardstand areas, substation and new roads and road upgrades, is estimated at 7.2 ha.

Most of the permanent habitat loss is improved grassland and conifer plantation. As these habitats have negligible ecological interest, the losses are rated as Not Significant. There will be losses of small areas of arable land and disturbed ground - as these habitats also have negligible ecological interest, the losses are rated as Not Significant.

The significance by the loss of areas of neutral grassland, gorse dominated scrub, and stone wall, habitats classified as Local Importance (lower value), is rated as a Slight Adverse Effect.

The Proposed Development will require interactions with 10 no. hedgerows (see **Figure 6.7 & Table 6.5**) to facilitate the route of the required access tracks between the infrastructure, resulting in the permanent loss of an estimated 55 m of hedgerow. Also, hedging is required to be removed at three of the site access points from the local roads, which amounts to an estimated total of 246 m. A further 324 m of hedging at the three access points will require regular trimming to approximately 0.6 m height to facilitate required sightlines (assessed as temporary loss). The hedgerows affected are typical of the area and vary in quality in terms of structure and diversity.

In addition, an estimated total of between 211 m and 249 m of hedging (depending on type of turbine selected) will be removed for the purpose of providing bat buffers around turbines where required (see **Chapter 7: Bat Ecology**).

The total amount of hedging to be removed permanently to facilitate construction of the Proposed Development is 301 m. When the additional loss as a result of the implementation of bat buffers is considered, there is a total maximum loss of 550 m.

Hedgerows are important habitats in the local area and support a range of flora and fauna species including breeding and feeding birds, foraging bats and small mammal species, a and a range of invertebrates. The Louth County Development Plan 2021-2027 recognises the importance of hedgerows in Chapter 8: Section 8.11 Trees, Woodlands and Hedgerows, with the following: "*Hedgerows make an important contribution to the County, serving as important habitat and wildlife corridors for the movement and distribution of flora and fauna through the landscape."* The Plan notes further: "*Where the removal of trees and hedgerows is unavoidable, the Council will require their replacement or adequate substitution."*

The significance of the loss of hedgerows due to the Proposed Development is rated as a Moderate Adverse Effect of Permanent Duration at a Local level of importance. The loss of hedgerows will be offset through a replanting scheme within the study area (see **Section 6.5.2.1** and **Appendix 6.1**).

The construction of Turbine T03 will result in the loss of 1.55 ha of scrub. The scrub, which is dominated by gorse and to a lesser extent blackthorn, is of some Local importance and the loss is rated as Slight Adverse Effect of Permanent Duration.

Table 6.5: Hedgerow impact locations to facilitate proposed new roads between wind farm infrastructure – see Figure 6.6 for locations. Rating is given on a scale from very low to very high ecological value (based on hedge structure and species diversity).

Hedge no.	Description	Rating
1	Approximately 5-6 m in height, mostly hawthorn and low ash. Medium sized ash at east end (both sides of existing field gate). Accompanying ditch.	Moderate value
2	Low hedge (2-3 m) mainly of hawthorn. No standards.	Low value
3	Low hedge (2-3 m) mainly of hawthorn, blackthorn & ash. No tree standards. Now merging with scrub on west side.	Low value
4	Former hedge not managed in recent times, now developing into scrub patch.	Very low value
5	Low hedge maintained at c.2 m on north side of track. Dominated by hawthorn. (see Plate 6.9)	Low value
6	Low unmanaged hedge with gaps. Mainly of hawthorn and blackthorn. Associated with small stream.	Very low value
7	Unmanaged hedge up to 5-6 m now developing into scrub patch. Dominated by blackthorn	Low value
8	Moderate sized hedge (up to 7 m), dominated with hawthorn and gorse, with ash including some larger specimens. Associated with substantial ditch.	Moderate value
9	Low maintained hedge (c. 1.5 m) dominated by blackthorn and bramble.	Low value
10	Good hedgerow/treeline. Dominated by ash and hawthorn, with some holly. Ditch on west side, (see Plate 6.11)	High value

6.4.4.2 Temporary loss of habitat

The three proposed site compounds will be constructed in areas of improved grassland and arable land. When the works are complete, the compound areas will be levelled and returned to their original agricultural use. As improved grassland and arable land are not of significant ecological value, the effect of this impact is Not Significant.

At the three access points to the site, trimming of an estimated 324 m of hedging to a height of 0.6 m will be required to facilitate sightlines. While the basal layer of the hedging will remain intact the structure of the hedging will be lost for the lifetime of the project. However, the low hedging on banks and with associated ditches will still provide useful habitat for local wildlife including small mammals and invertebrates. The significance of this impact is rated as a Slight Adverse Effect of Long-term Duration at a Local level of importance

To facilitate the delivery of the turbine components, hedgerows along one section (location no. 16) of the route will be removed (see **Chapter 2: Table 2.7** for details). The hedging will later

be replaced along the same sections of the road edges. It is estimated that approximately 150 m of hedging will be removed and later replanted. While the hedgerows removed temporarily will be replaced, it is considered that the new plantings will take up to ten years or more to develop structure and diversity comparable to the hedging being removed. The significance of the loss of hedgerows along the Turbine Delivery Route is rated as a Slight Adverse Effect of Medium-term Duration at a Local level of importance. In the long-term (>15 years), this effect is likely to become Neutral.

6.4.4.3 Disturbance to habitats

Areas of habitats adjoining the wind farm infrastructure will be disturbed by the construction works, including the construction of an onsite drainage system. This will result in areas and strips of bare soil, which would be prone to erosion. For most areas, the disturbance will be to improved grassland and cleared conifer plantation, habitats which are of low ecological value. For such habitats, this effect is rated as Not Significant. Mitigation is required, however, to minimise the areas of bare soil so as to limit the potential for soil erosion leading to effects on local watercourses.

A section of the track leading from Turbine T03 southwards towards T05 will run alongside the western end of the wetland complex. Any disturbance to adjoining areas of wetland habitat during the laying of the track could be Significant. For this reason, particular mitigation is required during the construction to avoid or minimise any disturbance (see **section 6.5.3**).

The laying of the Grid Connection cable will cause localised disturbance to marginal vegetation alongside the roads due to trenching works and use of plant machinery. The amount of disturbance would vary depending on the exact line of the trench but may affect grassy verges and roadside banks or ditches. However, hedging or trees are not proposed to be removed to facilitate the cable laying works. There are no habitats of significant ecological interest alongside the roads of the Grid Connection Route. After the trenching works are complete and the roadside strips re-instated, full recovery of the marginal vegetation is likely to take place within 1-2 years. The effect of disturbance to roadside habitats is rated as Not Significant.

6.4.4.4 Changes to existing habitats

A total of 1.71 ha of conifer plantation will be removed to facilitate the construction of the Proposed Development (see **Forestry Report, Appendix 2.2**). The provision of bat buffer areas around the T01 and T05 turbine bases will require the removal of an additional 7.68 ha of conifer plantation.

The area where trees/scrub are cleared to create the bat feature buffers will be rendered as unsuitable as possible to attract foraging bats and maintained as such throughout the lifetime of the Development. To achieve this, felled timber and branches will be removed, and stumps will be brushed to ground level. Any excess spoil from excavation works during construction can be broadcast to cover over any ground stumps, creating a more homogeneous surface. Additionally, the area will be prevented from scrubbing up again through a mowing and/or grazing regime. While such habitat will be of low value to local wildlife, the areas will provide open habitat for some invertebrate species, small mammals and passerine bird species. The effect of this impact by this change from conifer plantation to open ground is rated as a Positive effect of Slight significance.

6.4.4.5 Works along Turbine Delivery Route

As noted, hedging will be required to be removed at one location along the Turbine Delivery Route to facilitate the passing of the transport vehicles (see **section 6.4.4.2** above &~~and~~ **Chapter 2: Table 2.7**). This is at the Mullary Cross junction along the R132 and local road L6274. Approximately 150 m of hedging will be removed and later replanted, with further sections trimmed. This effect of this impact is rated as of Slight Significance.

In addition, the pruning back of branches of overhanging trees will be required along sections of the route (see details of locations in **Appendix 15.3**). The effect of pruning back of branches is Not Significant, though seasonal mitigation will apply for breeding birds (in compliance with Wildlife Acts).

6.4.5 Construction Phase Impacts on Drumshallon Lough and Wetland

The importance of the Drumshallon Lough wetland system was recognised in the early stage of the wind farm project and the design ensured that the entire lake and associated wetland habitats were not affected directly by the works. The closest wind farm infrastructure is the section of track running southwards from T03 towards T05, which passes the edge of the western end of the wetland area (see **Figure 6.8** & **Plate 6.20**). Here the ground is rising (both westwards and northwards) and comprises scrub and rushy wet grassland (see **Plate 6.20**). It is estimated that approximately 500 m^2 of wet grassland will be lost by track construction along the edge of the wetland but it is noted that the marsh habitat and especially the transition mire does not extend to this area. The loss of wet grassland is rated as a Slight Adverse Effect of Permanent Duration.

A further loss will be due to the construction of an attenuation basin alongside the new road and drain, with discharge overland by level spreader (see details in **Surface Water Management Plan, Chapter 11 Appendix 11.X).** This will require approximately 100 m^2 and will also be on ground dominated by wet grassland. However, this basin (or pond) will be open-bottomed, *i.e*. not lined, and wetland vegetation such as rushes and creeping bent will quickly become re-established. Hence, the loss is considered temporary and with some standing water likely for much of the time there could be beneficial effects for species such as the common frog. The loss of existing wet grassland due to the construction of an attenuation basin is rated as a Slight Adverse Effect of Temporary Duration but with time is likely to become a Neutral Effect or even a Slight Positive Effect.

The T03 turbine and associated infrastructure location is on higher ground above the wetland system. While the works will be in relatively close proximity to the wetland system, the ground here comprises stable rocky outcrop with minimal soil cover, and it is considered that there is no risk of slope failure as a result of the excavation works (see **Chapter 10: Soils and Geology, section 10.3.10).**

In the absence of mitigation, there is risk that contaminated run-off from the works associated with Turbine T03 could flow towards the wetland and lake at the base of the slope. Such an effect would potentially be a Significant Adverse Impact though of Temporary Duration. Mitigation is required during the entire construction phase to ensure that contaminated water is not allowed to flow towards the lake and wetland system - this is detailed in **Chapter 11** and in the accompanying CEMP (**Appendix 2.1),** as well as **section 6.5.3.**

Plate 6.20: View from location of proposed track (bottom on image) running north to south (left to right in foreground of image) looking eastwards over wetland habitat. Here the habitat is rank wet grassland. (December 2023).

6.4.6 Construction Phase Impacts on Terrestrial Mammals, Amphibians and Reptiles

The loss of habitats, both permanent and temporary, to facilitate the Proposed Development is not expected to have any Significant effect on the various terrestrial mammal species which were recorded during the baseline surveys. All of these species, including badger, Irish hare and red squirrel, are widespread species of the countryside and will continue to utilise the habitats within the wind farm study area during the operational phase. While mammal species will avoid active work areas, this will be a localised and temporary effect (and not generally relevant to nocturnal mammal activity) and the effect is considered to be Not significant.

It is noted that the loss of locally important habitats, namely hedgerows, will be offset by an extensive woodland planting scheme (see BEMP **Appendix 6.1**), which will benefit terrestrial species such as red squirrel and badger in the medium and long-term.

Otter is expected to occur on the Drumshallon Lough Stream and probably on the Piperstown Stream. While there will be no direct effects on these watercourses, the local otter populations downstream of the sections of watercourses affected by the Proposed Development could be affected adversely if contaminants generated during the construction

phase, such as suspended solids, hydrocarbons and cementitious materials, were to enter the local watercourses and affect the prey items (fish etc.) of the otter. In the absence of mitigation, the effect on the otter population would be potentially Significant. Mitigation to maintain water quality during the construction and operational phases of the Proposed Development will minimise the risk to the otter population.

The common frog is widespread at least within the Drumshallon wetland area and may occur in drains and seasonally wet ground elsewhere on site. It is unlikely that there will be any significant adverse effects on this species as a result of the proposed development as there will be no impacts on the main habitat used by the species (namely the Drumshallon wetland complex). It is noted that existing wetland habitat will be enhanced as part of the BEMP and this will benefit the common frog.

The common lizard population is likely to be confined to the rocky, scrubby areas of the site. Part of this habitat will be affected by the construction of Turbine T03, and the effect on the common lizard is rated as of Slight Significance. The species will still retain presence on site as suitable habitat is widespread in this area.

6.4.7 Operational Phase Impacts

The operation of the wind farm does not have the potential to have effects on adjoining terrestrial habitats, vegetation or flora species.

In absence of mitigation, the permanent presence of oils and lubricants associated with turbine maintenance has potential to enter and pollute local watercourses. If such substances leaked from the turbines or maintenance areas or were disposed of inappropriately, there is a risk of water pollution. While the likelihood of this occurring is low, mitigation is required to minimise any risk.

The operation of the wind farm does not have potential to have any significant adverse effects on terrestrial mammal species, amphibians or reptiles.

With the Biodiversity Enhancement Management Plane implemented, the importance of the ecology of the site will be increased during the lifetime of the Wind Farm.

6.4.8 Decommissioning Phase Impacts

A Decommissioning Plan accompanies the EIAR (see **CEMP Management Plan 6: Decommissioning Plan**). There follows an overview of the decommissioning process.

The Developer is applying for a consent for an operational period of 35 years for the Wind Farm. It is intended that all above ground components and underground cabling (ducting left in-situ) will be removed from the Wind Farm Site as part of the decommissioning of the Wind Farm. The following elements are included in the decommissioning phase:

- Removal of 5 no. wind turbines and concrete plinths
- Removal of 1 no. permanent meteorological masts
- Removal of all associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation. Ducting is to remain in-situ.

All other elements of the Proposed Development will remain in-situ. The Site Access Tracks and associated drainage systems will serve ongoing forestry and agriculture activity in the area. All other hard surfaced areas will be allowed to revegetate naturally. Based on the experience of the project team monitoring operational wind farm sites throughout the country, the approach of allowing these areas to revegetate naturally has proven to be very successful.

Potential impacts are likely to be similar to that of the construction phase, to an equal or lesser extent. Some of the potential issues could include:

- Potential disturbance of sensitive habitats, especially wetlands, in the vicinity of the infrastructure
- Potential disturbance of species such as badger

The Plan will take account of the findings of the EIAR for the present project to manage and control the component removal and ground reinstatement.

The key following measures will be implemented as part of the Decommissioning Plan:

- It will be ensured the decommissioning works and activities are completed in accordance with mitigation and best practice approach presented in the accompanying Environmental Impact Assessment Report (EIAR) and associated planning documentation.
- It will be ensured the decommissioning works and activities have minimal impact/disturbance to local landowners and the local community. This will relate to transport, particularly of material off site with noise and dust also impacting on receptors at time of decommissioning to a lesser extent.

- It will be ensured the decommissioning works and activities have minimal impact on the natural environment. Disturbance to habitats will be avoided and the use of existing infrastructure and drainage will ensure silt does not enter waterways.
- A sustainable approach will be adopted to decommissioning. This means comparing alternative methods for turbine disassembly and taking the approach with the least impact on the natural environment; and,
- The provision of toolbox talks, environmental training and awareness of sensitive receptors and waste management within the Wind Farm Site will take place for all project personnel.

Habitats

From the perspective of terrestrial ecology, the anticipated potential impact from decommissioning works would be disturbance to the Drumshallon Lough wetland system by the removal of Turbine T03. As with the construction phase, issues such as the potential for soil slippage will be considered. Mitigation will be required to ensure that no contaminants from work areas enter the lake and wetland area. With work carried out in accordance with the Decommissioning Plan, the effect of the Decommissioning works will be Not Significant.

Fauna species

Particular care will be taken to ensure that the Decommissioning works do not cause disturbance to terrestrial species occurring on the Wind Farm Site at the time and especially badger. As 35 years will have passed, baseline surveys will be carried out for species identified of conservation importance during the 2023-24 baseline surveys, as well as for further species of importance which may be present at the time of the works. Relevant legislation relating to flora and fauna in force at the time will be strictly adhered to.

Mitigation measures described in the present report to avoid or minimise disturbance to protected fauna species will be implemented (see **sections 6.5.4, 6.5.5 & 6.5.6**).

With the above approach followed, the effect by decommissioning works on terrestrial fauna species is rated as Not Significant.

Maintenance of water quality

The issue of potential impacts on local hydrology during decommissioning is assessed in **Chapter 11: Hydrology and Hydrogeology (section 9.4.7)**. The assessment notes the following:

Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.

No significant effects on the hydrological and hydrogeological environment are envisaged during the decommissioning phase of the Development.

On this basis, it is likely that the Decommissioning works will not result in adverse effects on local watercourses.

Creation of new habitat

The Decommissioning Plan specifies that the turbine hard stands will be allowed to naturally revegetate. At the time of Decommissioning, parts of the hardcore surface will likely already support a sparse flora of annual and perennial species (this is normal to see at operational wind farms after a few years and indeed often attracts sheep to graze the tender shoots). The amount of vegetation that will eventually colonise will depend on the chemical character of the gravel surface, *e.g.* a calcareous substrate would support a higher diversity of plants than an acidic substrate. Such recolonising surfaces, which retain more warmth in sunshine compared to surrounding soil, tend to attract insects (butterflies *etc.*) as well as passerine bird species such as skylark and various finches, with the birds feeding on seeds from plants. The habitat that would be expected to develop is likely to fall into a mosaic of semi-natural grassland (GS) and artificial stone surfaces (BL3).

The natural re-vegetation of the above-mentioned surfaces is rated as a Positive effect of Moderate significance.

6.5 MITIGATION MEASURES

6.5.1 European Sites

The AA Screening report that accompanies this planning application has shown objectively that in the absence of mitigation, likely or possible significant effects on four of the European sites could not be excluded during the construction, operational and/or decommissioning stages of the Proposed Development. The four sites are:

- Boyne Coast and Estuary SAC (code 001957)
- River Boyne and River Blackwater SAC (code 002299)
- Dundalk Bay SAC (code 000455)
- Dundalk Bay SPA (code 004026)

The objective of the mitigation measures is to avoid, minimise and control contaminated run-off entering drains and local watercourses and potentially the identified European sites which are hydrologically linked to the project site. The achievement of this objective is outlined in the following sections, with details in **Chapter 9: Aquatic Ecology**, **Chapter 11: Hydrology and Hydrogeology**, and in the accompanying **NIS**.

The potential for risk to local watercourses and ultimately the identified qualifying interests of the three SACs is largely during the construction phase of the Development. It is not envisaged that the operational phase or the decommissioning phase of the Development will result in significant impacts on the hydrological regime or water quality of the area.

A Construction and Environmental Management Plan (CEMP) is appended to the EIAR in Technical **Appendix 2.1**. This document will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect biodiversity and the environment, are implemented. The accompanying CEMP has been prepared on the basis that it will be further developed and expanded following the appointment of the Contractors for the main construction works (as some items can only be finalised with appropriate input from the Contractor who will actually carry out the main construction works).

Prior to commencement of construction works, the Contractors will identify a core Environmental Management Group, comprising of specific project personnel and an Ecological Clerk of Works (ECoW). The group will draw on technical expertise from relevant specialists where required and will liaise with other relevant external bodies as required (such as Inland Fisheries Ireland).

The Ecological Clerk of Works will be responsible for coordination, compliance monitoring and continued development of the CEMP and any other surveys, reports or method statements required. The ECoW will also review the Contractors' method statements and environmental plans as required by the CEMP, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group and required liaisons between Louth County Council, the Contractors, and other statutory authorities. The Ecological Clerk of Works (ECoW) will have appropriate experience such as working on large scale renewable projects and with relevant qualifications, *e.g.* BSc in ecology or environmental management and accreditation such as CIEEM.

All of the described measures are focused on preventing contaminated water from entering local watercourses which are linked to European sites. When in force, the mitigation measures will be monitored by the Environmental Manager/Ecological Clerk of Works to ensure their efficacy (for details see **EIAR Chapter 2: section 2.7.13**). Even though the mitigation measures represent standard best practice and are proven to be effective, should an unexpected failure in the mitigation occur, immediate action will be taken in accordance with the site-specific Emergency Plan (**CEMP – Management Plan** 1).

With such mitigation in place and rigorously enforced, it is concluded that there will not be any significant effects on the qualifying interests of the identified designated sites as a result of the Proposed Project.

6.5.2 Mitigation for Habitats

The Proposed Development will result in the loss of a limited amount of habitat of significant ecological importance in a local context, namely sections of hedgerow/treeline (see **section 6.4.4.1**) and to a lesser extent scrub (1.55 ha). Part of the losses will be from implementation of bat buffer zones. These habitats are of value for a range of local wildlife, including small mammals, bats, birds and invertebrates. In addition, a small area of wet grassland will be lost by a section of track leading southwards from Turbine T03 (estimated at 500 m^2).

The losses will be offset through a Biodiversity Enhancement and Management Plan (BEMP). The BEMP is outlined in **Section 6.8** and is presented in full in **Appendix 6.1**. Briefly, the BEMP area comprises the following: (i) the enhancement of existing wetland habitat to the south and west of Drumshallon Lough (3.52 ha), and (ii) the planting of an area of broadleaved woodland (0.52 ha).

The loss of the a relatively small area (500 m^2) of wet grassland along the western edge of the Drumshallon wetland system will be offset by the enhancement of a considerably larger area of similar habitat within the BEMP area.

The permanent loss of hedgerows to facilitate the Proposed Development will amount to an estimated 301 m. An additional loss of 249 m (maximum) will be lost as a result of the implementation of bat buffers at the turbines. With an average hedgerow width of 3 m, this equates to 1,650 m^2 (0.165 ha). The loss will be offset by the planting of 0.52 ha of broadleaved woodland (which includes mitigation planting for bats). The plantings will include a mix of species ranging from oak to hazel and hawthorn, and, apart from some beech which is included specifically as mitigation for bats, will be native species of certified

Irish genetic stock. Full details of the planting scheme and its implementation are given in the BEMP (**Appendix 6.1**).

6.5.3 Drumshallon Lough Wetland System

While sensitive design has avoided almost entirely the Drumshallon Lough wetland system, there is minor encroachment by track at extreme western end and potential for run-off during works on the higher ground adjoining the lake and wetland. Specific mitigation to minimise any effects on the system, will comprise:

- Supervision by ECoW when track construction is in progress so as to minimise disturbance of adjoining wetland ground on the eastern side,
- Use of stone of similar chemical composition for track bases in area of wetland,
- Strict adherence to measures to ensure that there is no run-off of contaminated water from work areas close to the wetland (as described in **Chapter 11: Hydrology and Hydrogeology** and the **CEMP**).

6.5.4 Otter

While there was no evidence of otter breeding sites on any of the watercourses associated with the site, otter has a presence on the Drumshallon Lough Stream and may at times feed within the lake itself. Such populations could be affected adversely by pollutants entering the watercourses as a result of activities associated with the Proposed Development.

The mitigation proposed to maintain water quality in the aquatic zones (as detailed in the **Chapter 9: Aquatic Ecology Assessment Appendix 6.3** and in **Chapter 11: Hydrology and Hydrogeology** and summarised in the CEMP) will ensure that the food supplies for otters within local watercourses are not affected by contaminants generated by the Proposed Development.

6.5.5 Badger

Badger is present in the study area though no setts were recorded during the baseline surveys.

As distribution of local populations can change over time, should more than 24 months have elapsed by the commencement of construction since the baseline surveys in 2023-24, a pre-construction confirmatory survey will be undertaken in accordance with NRA Guidance (2006). This will focus on the areas of the site where works will take place (to a distance of approximately 100 m).

Should an active sett be located within a 50 m distance of the works area, mitigation would be necessary to ensure that the sett is closed prior to the commencement of any works onsite. This procedure would be carried out in strict accordance with relevant legislation.

6.5.6 Common frog and common lizard

The common frog is widespread within the Wind Farm Site occurring in drains, fields which have a wet character, and in the wetlands associated with Drumshallon Lough.

Areas where construction works are due to commence during the period February to August will be checked by the ECoW for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed prior to the commencement of any construction works in the area under licence from NPWS and transferred to suitable drains or wetlands in the vicinity and away from the construction footprint.

The common lizard was recorded in the areas of open scrub and shallow soils in the location of Turbine T04. The ECoW will be aware of the likely presence of this species and will review the work areas by visual inspection prior to the entry of plant machinery. Should a lizard be observed, it will be retained in a suitable container and released in similar habitat away from the construction foot-print.

6.5.7 Invasive plant species

The baseline surveys have identified the presence of two Third Schedule List invasive species, namely Japanese knotweed and Himalayan balsam, at two locations within the study area (see **section 6.3.3.15** and **Figure 6.5**).

Best practice measures as described below will be taken throughout the construction phase to prevent the spread of these invasive alien species and the introduction of further species.

The commencement of works will be preceded by a detailed confirmatory survey for invasive species.

During construction, the following best practice measures will be implemented:

- Where the presence of an invasive species is identified, the treatment and control of same will follow guidelines issued by the National Roads Authority - The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010).

- Good construction site hygiene will be employed to prevent further introduction of invasive plant species and/or spread of sources within the site to outside areas, by thoroughly washing vehicles prior to entering site and prior to leaving site.
- Any soil or topsoil required on the site will be sourced only from a stock that has been screened for the presence of invasive species

Implementation of the above measures will ensure that there will be no significant effect with regard to Third Schedule invasive species as a result of the proposed development.

6.6 CUMULATIVE IMPACTS

Cumulative wind farm and solar energy projects within a 20 km distance of the Proposed Development projects are described in **Chapter 2: section 2.4.4**.

There are a total of five wind farm projects which collectively have a total of 7 no. turbines. These are at distances of between 11.4 km and 19.5 km of the Proposed Wind Farm Site. With substantial distances between the Proposed Wind Farm and the other wind projects, and with no ecological connectivity, it is considered that there is no potential for cumulative impacts on terrestrial ecology when the proposed development is considered with the four other wind farms. The active Kilsaran quarry is situated adjacent to the Proposed Development (see **Chapter 2: Figure 2.4)**. Turbine T02 is the nearest turbine approximately c.210 m from the quarry site boundary.

The quarry commenced operation in 1993 following receipt of planning. The site comprises approximately c. 84.5 hectares. The extractive methods currently practiced on site are comprised of topsoil and overburden removal, drilling, blasting, crushing, washing and screening of rock to produce roadmaking stone, stone for concrete and general aggregates. The quarry site has recently been granted planning permission (LCC Reg. Ref. 22109) on the 27th November 2023 to extend the extractive area to include a parcel of land comprising c. 10 ha to a proposed depth of +60m AOD. This area of land is located to the central eastern portion of the site. The extraction is expected to continue for a period of 25 years. Review of aerial photography (OSI Geohive) dating to 1996 indicates that the quarry was built on ground dominated by gorse scrub similar to which occurs in the yet undeveloped sectors of the quarry and also in the area of proposed Turbine T04. The baseline survey for the proposed wind farm has rated such scrub as of some local importance, especially when it is of a more open type and mixed with species such as hawthorn and blackthorn. The proposed wind farm development will contribute to a cumulative loss of scrub habitat from the area when considered with the quarry facility. However, as the scrub is dominated

by gorse, a habitat of low ecological interest (rated Local Importance, lower value), the significance of a cumulative loss of scrub is rated, at most, as a Slight Adverse effect.

Other Landuse Activities

Commercial forest operations and agricultural activities both have the potential for the release of sediment and nutrients to the aquatic environment, which can have negative effect on the interests of local watercourses and ultimately (where relevant) European sites which receive the inflowing waters.

The results from the Aquatic Ecology Assessment (**EIAR Chapter 9**) indicate that all sites sampled within the study area are moderately polluted, with macroinvertebrate surveys giving a Q value of Q3, Moderately Polluted, for all sites. These results were consistent with the chemical water quality results.

With implementation of the strict mitigation measures, as discussed within the accompanying CEMP, the Forestry Report, the Grid Connection Outline Construction Methodology, and in **Chapter 9: Aquatic Ecology,** during the construction, operational and decommissioning phases of the Proposed Development to ensure the protection of local watercourses, the Proposed Development will not contribute to any significant cumulative effect on local watercourses and potentially European sites when considered in combination with commercial forestry and agricultural activities within the catchment.

6.7 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

The strict mitigation measures which will be enforced to maintain water quality within on-site drains and local watercourses during the Construction, Operational and Decommissioning phases of the Proposed Development will ensure that there will be no significant residual effects on water quality or aquatic habitats and species, including otter. As potential effects on European designated sites as a result of the Proposed Development would arise from contaminants carried within watercourses, it follows that there will be no likely significant effects on identified designated sites (European and National) with hydrological connectivity with the Proposed Development site.

With mitigation measures implemented in full to minimise effects on local habitats, including enhancement of a Nationally Important wetland, as well as a native woodland planting scheme, the impact by loss of hedgerows, scrub and a small area of wet grassland is reduced to the level of Slight Significance.

With mitigation measures as presented implemented in full, it is considered that the significance of the predicted impact on terrestrial mammal species and amphibian and reptile species as a result of the Proposed Development will be Not Significant.

With the implementation of the Biodiversity and Enhancement Plan, it is considered that the terrestrial ecological interests of the Site will increase during the operational phase of the Proposed Development, *i.e.* likely long-term Positive effect.

6.8 BIODIVERSITY ENHANCEMENT

The Biodiversity and Enhancement Management Plan (BEMP) is presented in **Appendix 6.1**. The objectives of the Plan are as follows:

Objective no. 1

To preserve and enhance existing wetland habitat, rated as of National Importance, by removal of grazing and control of spread of gorse scrub to offset the loss of wet grassland, and to comply with Policy Objective NBG 20 of Louth County Development Plan 2021-2027.

Objective no. 2

To offset the loss of hedgerows by a tree and shrub planting programme.

Objective no. 3

To enhance habitat for bats and to offset loss of hedging and forest edge due to implementation of bat buffers at turbines.

The achievement of the objectives will be evaluated through a detailed monitoring and reporting programme.

It is anticipated that with the implementation of the BEMP, the overall ecological value of the Site will increase over time, with benefits not just for habitats and bats but also birds, mammals and invertebrates.

The objectives for the Plan are achievable, as the methods to be used are straightforward and have been implemented at many other sites throughout Ireland.

It is noted that the Plan will allow for remediations and/or modifications to ensure that the objectives are being achieved throughout the lifetime of the Proposed Development

A reporting schedule will be agreed with the Planning Authority as evidence of compliance.

6.9 PRE-CONSTRUCTION AND CONSTRUCTION PHASE MONITORING

6.9.1 Pre-construction badger survey

If two or more years lapse from between the planning-stage surveys (carried out in 2023-24) and commencement of construction works, including tree-felling, a badger survey will be carried out in areas of potential suitable habitat which will be disturbed by the works as the local distribution of badger may have changed in that period.

Should the pre-construction survey indicate a requirement for protection of badger, appropriate measures will be taken to comply with all relevant legislation and best practice guidance in force at the time.

6.9.2 On-going monitoring during construction

An Ecological Clerk of Works (ECoW) will be employed by the Contractor for the duration of the construction phase and will ensure that all mitigation measures relating to ecology described in this report and contained within the planning permission are implemented. The ECoW will have appropriate experience such as working on large scale renewable projects and with relevant qualifications, *e.g.* BSc in ecology or environmental management and accreditation such as CIEEM.

6.10 POST-CONSTRUCTION MONITORING

6.10.1 Habitats

Post-construction habitat monitoring will focus on the following:

- All ground which had been disturbed by construction activities;
- Replanted hedgerows along relevant sections of TDR;
- The Biodiversity and Enhancement Management Plan area (see details in **Appendix 6.1**).

When all ground works are complete on Site, a vegetation survey will take place by an ecologist. This will describe the state of the vegetation in the areas where disturbance has occurred, and which may have been reseeded. The purpose is to minimise the risk of soil erosion. These areas will be revisited in each of the first three years following construction by which time previously bare surfaces should be fully re-vegetated. At that stage, any areas still considered prone to soil erosion will be subject to further planting and/or stabilisation works.

All replanted hedging will be monitored in Years 1, 2, 3 and 5 to ensure that the planted stems have taken. Any failed plantings will be replaced.

Monitoring within the Biodiversity and Enhancement Management Plan area is described in **Appendix 6.1.**

Reports will be prepared for each year of monitoring and issued to the relevant planning authority.

6.11 SUMMARY OF SIGNIFICANT EFFECTS

With the implementation of mitigation through avoidance principles, pollution control measures, surface water drainage measures and other preventative measures which have been incorporated into the project design and into the construction, operational and decommissioning phases, in order to minimise potential significant adverse impacts on water quality within the zone of influence of the Proposed Development, it can be concluded that the Proposed Development will not adversely affect the integrity of any European or National designated site.

With mitigation measures implemented in full to minimise effects on local habitats, including enhancement of an area of wetland habitat, as well as a native woodland planting scheme, the impact by loss of hedgerows, scrub and a small area of wet grassland is reduced to the level of Slight Significance.

With mitigation measures as presented implemented in full, it is considered that the significance of the predicted impact on terrestrial mammal species and amphibian and reptile species as a result of the Proposed Development will be Not Significant.

With the implementation of the Biodiversity and Enhancement Plan, it is considered that the terrestrial ecological interests of the Site will increase during the operational phase of the Proposed Development, *i.e.* likely long-term Positive effect.

6.12 REFERENCES AND BIBLIOGRAPHY

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