



Screening for Appropriate Assessment Report and Natura Impact Statement

Proposed Ballinla Wind Farm, Co. Offaly

Ballinla Wind Farm Ltd.

August 2025

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1. Summary of Findings

1.1 Screening for Appropriate Assessment

Project Title	Ballinla Wind Farm
Project Proponent	Ballinla Wind Farm Ltd.
Project Location	Townlands of Leitrim, Lumville, Ballinla, Clarkeville, Ballyfore Big, Ballyfore Little, Ballyleakin, Ballykilleen (Coolestown By) and Ballina (Geashill By) in County Offaly.
Appropriate Assessment	<p>The Appropriate Assessment was undertaken to determine the potential for likely significant effects of the proposed project, individually, or in combination with other plans or projects, on Natura 2000 Sites identified within this report in view of those Sites conservation objectives.</p> <p>These sites included:</p> <ul style="list-style-type: none"> • The Long Derries, Edenderry SAC (Site Code: 000925) – screened out. • Raheenmore Bog SAC (Site Code: 000582) – screened out. • River Barrow and River Nore SAC (Site Code: 002162) – screened in. • River Boyne and River Blackwater SAC (Site Code: 002299) – screened in. • River Boyne and River Blackwater SPA (Site Code: 004232) – screened in. • Lough Ennell SPA (Site Code: 004044) – screened out. • Slieve Bloom Mountains SPA (Site Code: 004160) – screened out. • Charleville Wood SAC (Site Code: 000571) – screened out.
Conclusion	<p>Following Screening for Appropriate Assessment, the River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (Site Code: 004232) were screened in for Appropriate Assessment due to hydrological connectivity and the site's designations for qualifying aquatic/riparian species and habitats.</p> <p>A Natura Impact Statement was prepared to assess potential impacts on the integrity of these sites as a result of the Proposed Development. It has been concluded, beyond reasonable scientific doubt, that the Proposed Development will not result in adverse effects on the integrity of any European site, either alone or in combination with other plans or projects, in view of their conservation objectives.</p>

2. Introduction

2.1 Purpose of the Assessment

Malachy Walsh and Partners (MWP) Engineering and Environmental Consultants was commissioned by Ballinla Wind Farm Limited ('the Applicant') to prepare an Appropriate Assessment (AA) report for a seven turbine wind farm and ancillary development in the townlands of Leitrim, Lumville, Ballinla, Clarkeville, Ballyfore Big, Ballyfore Little, Ballyleakin, Ballykilleen (Coolestown By) and Ballina (Geashill By) in County Offaly, (hereafter referred to as the 'Proposed Development').

This Natura Impact Statement (NIS) includes an AA Screening (**Section 4**) to identify any likely significant effects from the Proposed Development on European sites (which comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)). Where likely significant effects from the Proposed Development cannot be excluded, either alone or in-combination with other plans or projects, a detailed AA (NIS) has been carried out in **Section 5** to determine whether this could result in adverse effects on the integrity of any relevant European site, either alone or in-combination with other plans or projects, and in view of the site's conservation objectives.

This report has been prepared in order to provide a sufficient level of information to the competent authority, in this case An Coimisiún Pleanála (ACP), to determine whether the Proposed Development, either alone or in-combination with other plans or projects, could have adverse effects on the integrity of any European sites, in view of the conservation objectives of any such sites.

The report comprises a description of the Proposed Development, particularly in relation to the aspects that could interact with the receiving environment, the identification in **Section 4.5** of the impacts that are reasonably foreseeable as potentially ensuing from it, and a determination as to whether these predicted impacts, either alone or in combination with the other plans or projects identified in **Section 4.3**, are likely to have significant effects on the Natura 2000 sites identified in **Section 4.4**, in view of those sites' conservation objectives.

2.2 Statement of Competency

The screening for AA report has been prepared by Jennifer Snook (BSc). Jennifer is an Ecologist at MWP and has been working in the ecology sector in Ireland since 2022 completing numerous ecological surveys and reports for a range of projects across different industries. Jennifer is particularly competent in bird, mammal and habitat survey methodologies with over three years of experience in these areas. In 2023, Jennifer qualified with a Bachelor of Science (Honours) in Wildlife Biology from Munster Technological University, Tralee, Co. Kerry and has a DipHe in Business Management. Jennifer has undertaken numerous in-house training courses, including bird, bat, and badger survey methodologies, as well as manual handling and Safe Pass certification. Jennifer has also completed the Native Woodland Conservation training course, delivered in conjunction with the Forest Service of the Department of Agriculture, Food and the Marine (DAFM) and the National Parks and Wildlife Service (NPWS), and is now an accredited NWC (Native Woodland Conservation) Ecologist.

The Screening for AA report was reviewed by Úna Williams (BSc. MSc.), a Senior Ecologist and Environmental Scientist at MWP. Úna has worked at MWP for nearly six years and is an experienced field ecologist and report writer. She has worked on research teams both in Ireland and abroad and has carried out various ecological surveys including habitat/survey mapping and zoological surveys. She has undertaken assessments for a wide variety of projects including renewable energy, infrastructural and coastal developments, and has designed and completed Avian Collision Risk Models for proposed wind farms. Úna has authored many ecological reports including Screening for AA Reports (Stage 1), NIS (Stage 2), Ecological Impact Assessments (EclA), and

Environmental Impact Assessments (EIA). She graduated from Queen's University Belfast in 2018 with an MSc in Animal Behaviour and Welfare, and from Trinity College Dublin in 2008 with an Environmental Science degree.

The NIS was prepared by Bernice Cahill (BEng, MSc) with input by Hazel Dalton (BSc., BBus.). Bernice is an environmental professional with over 15 years of expertise in EIA and NIS coordination. She holds a Bachelor of Engineering in Civil, Structural and Environmental Engineering from Cork Institute of Technology and a Master of Science in Environmental Engineering from Queen's University Belfast. Bernice has led and contributed to numerous complex projects requiring detailed ecological assessment and regulatory compliance under the EU Habitats and Birds Directives.

Hazel is a Principal Ecologist with MWP with over ten years' experience in ecological consultancy since graduating with a first-class Honours Degree in 'Wildlife Biology' from Munster Technological University (MTU) in 2015. Hazel is experienced in ecological surveying and impact assessment for Appropriate Assessment (AA) and EIAR. She has authored and contributed to screening reports for AA, Natura Impact Statements (NIS), Ecological Impact Assessments (EclA) and Biodiversity chapters of EIARs. Hazel is an experienced field ecologist with a diverse ecological survey profile including habitats and flora, mammals, bats, birds and terrestrial invertebrates. She has held/holds National Parks and Wildlife Service (NPWS) Licences for small mammal trapping, tape lure/endoscope bird surveys, Kerry slug surveys, disturbance of bat roosts, undertaking bat surveys and photographing wild animals (badger and otter) at their resting/breeding places.

2.3 Project Overview

The Proposed Development for which consent is being sought comprises the construction of seven wind turbines, an onsite 110 kilovolt (kV) substation and all ancillary works in County Offaly (the Proposed Wind Farm), in addition to temporary works along the turbine delivery route (TDR) (the Proposed TDR). This AA screening report also considers the associated grid connection (the Proposed Grid Connection), which will be subject to a separate planning application.

However, for the purposes of this assessment, the 'Proposed Development' refers to all elements of the proposed wind energy project including the new underground grid connection cable as further described in **Section 4.2**. This Screening for AA report considers the Proposed Development and all additional components of the project.

2.4 Legislative Context

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats of wild fauna and flora by the designation of SACs, and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of SPAs. It is the responsibility of each European Union (EU) member state to designate SPAs and SACs, both of which form part of Natura 2000, a network of protected sites throughout the European Community. The European Communities (Birds and Natural Habitats) Regulations 2011-2021 transpose the Habitats Directive and the Birds Directive into Irish law. The requirement for AA of the implications of plans and projects on the Natura 2000 network of sites comes from the Habitats Directive (Article 6(3)).

Under the European Communities (Birds and Natural Habitats) Regulations 2011, a public authority is required to carry out a screening for AA of a proposed development prior to issuing consent to assess, in view of best scientific knowledge and the sites conservation objectives, if that project or plan, individually or in combination with other plans or projects is likely to have a significant effect on a Natura 2000 site.

The screening for AA will determine whether an AA of the Proposed Development is required if it cannot be excluded, on the basis of objective information, that the Proposed Development, individually or in combination

with other plans or projects, will have a significant effect on a Natura 2000 site, in view of the site's conservation objectives.

If it is determined that an AA is required in respect of the construction, operation, and decommissioning of proposed wind farm, an NIS must be prepared. The NIS will assist the competent authority to conduct the AA for the Proposed Development.

2.5 Stages of Appropriate Assessment

The AA process is a four-stage process with issues and tests at each stage. The purpose of this assessment is to record in a transparent and reasoned manner the likely effects on Natura 2000 sites of a Proposed Development. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are set out in **Appendix 1**. This assessment has proceeded as far as Stage 2.

3. Methodology

3.1 Appropriate Assessment Guidance

This report has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2021), the European Commission Guidance '*Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*' (EC, 2018), '*Appropriate Assessment of Plans & Projects - Guidance for Planning Authorities*' prepared by the NPWS (DoEHLG, 2010), and the Office of the Planning Regulator (OPR) Practice Note '*Appropriate Assessment Screening for Development Management*' (OPR, 2021).

3.2 Desk Study

In order to complete the screening for AA report, certain information on the existing environment is required. A desk study was carried out to collate available information on the subject site's natural environment. This comprised a review of the following publications, data and datasets:

- Ordnance Survey Ireland (OSI) aerial photography, 1:50000 mapping and online satellite imagery sources.
- National Parks and Wildlife Service (NPWS).
- National Biodiversity Data Centre (NBDC) (on-line map-viewer).
- BirdWatch Ireland (online datasets).
- Teagasc soil area maps (NBDC website).
- Geological Survey Ireland (GSI) area maps.
- Environmental Protection Agency (EPA) water quality data.
- Eastern River Basin District (ERBD) datasets (Water Framework Directive).
- The Offaly County Development Plan 2021-2027¹.
- The Offaly Biodiversity Action Plan 2025 – 2030².

¹ <https://www.offaly.ie/c/county-development-plan/>

² <https://www.offaly.ie/offaly-biodiversity-action-plan/>

- Review of requested records from NPWS Rare and Protected Species database.
- Natura 2000 Standard Data Forms.
- Other information sources and reports footnoted throughout the report and listed in **Section 8**.

GIS shapefiles downloaded from the websites of the NPWS and EPA along with mapping of the Proposed Development were transferred to a GIS platform to allow information on the natural environment to be analysed.

Watercourse naming follows EPA nomenclature. Watercourse order is described using the classification system given in Strahler (1957) which defines stream size based on a hierarchy of tributaries (with 1st order streams being the smallest). In relation to referencing riverbanks, 'RHS' refers to right hand side and 'LHS' refers to left hand side, when looking downstream.

3.2.1 Data Request and Database Search

The study area lies within the Ordnance Survey National Grid hectads N42, N52, N53 and N62. Concise and site-specific information on species records available in these hectads was retrieved from the NBDC on-line database and reviewed. This included a search for NBDC species record within the townland of Ballina (Geashill By) within which temporary road widening works are proposed at a TDR node. A data request for records of rare and protected species records from the hectad N53 was submitted to NPWS on the 20th November 2024. An updated data request was submitted to NPWS on the 1st August 2025 for all relevant hectads (N42, N52, N53 and N62). Data was received from the NPWS on the 25th August 2025.

Information received via the NBDC and NPWS and downloaded from the NPWS website was used to help inform the impact assessment in relation to the proposal.

3.2.2 Consultation

The following statutory and non-statutory bodies were consulted in relation to biodiversity issues from the Proposed Development:

- An Taisce.
- Department of Agriculture, Food and the Marine.
- Department of Business, Enterprise and Innovation.
- Department of Communications, Climate Action and Environment.
- Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media.
- Department of Housing, Local Government & Heritage.
- Health Service Executive.
- Inland Fisheries Ireland.
- Commission for Regulation of Utilities (CRU).
- Department of Transport.
- Transport Infrastructure Ireland (TII).
- Fáilte Ireland.
- Heritage Council.
- Irish Aviation Authority.
- Waterways Ireland.
- Birdwatch Ireland.
- Friends of the Earth.
- Friends of the Irish Environment.
- Irish Peatland Conservation Council.

- Irish Wildlife Trust.

3.2.3 Study Area

The study area refers to a broad geographical area within which habitats and biodiversity have been identified and assessed. This area comprises land and natural features, including areas outside the immediate project footprint, and is used to determine baseline data collection and to ensure all ecological aspects are considered.

The study area for this Proposed Development represents the extent of land potential wherein which the Proposed Development may be situated, the geographic extent of which is limited to folio boundaries. The Proposed Development boundary refers to the areas within which construction and operational phase activities associated with the proposed wind energy development will take place. This boundary is confined to the immediate project footprint and includes turbine hardstands, substation, access tracks and other ancillary infrastructure. The Proposed Development boundary represents the physical limits within which works will take occur and any potential impacts to biodiversity will be assessed with respect to this defined area. Please refer to **Figure 1** for the Proposed Development boundary.

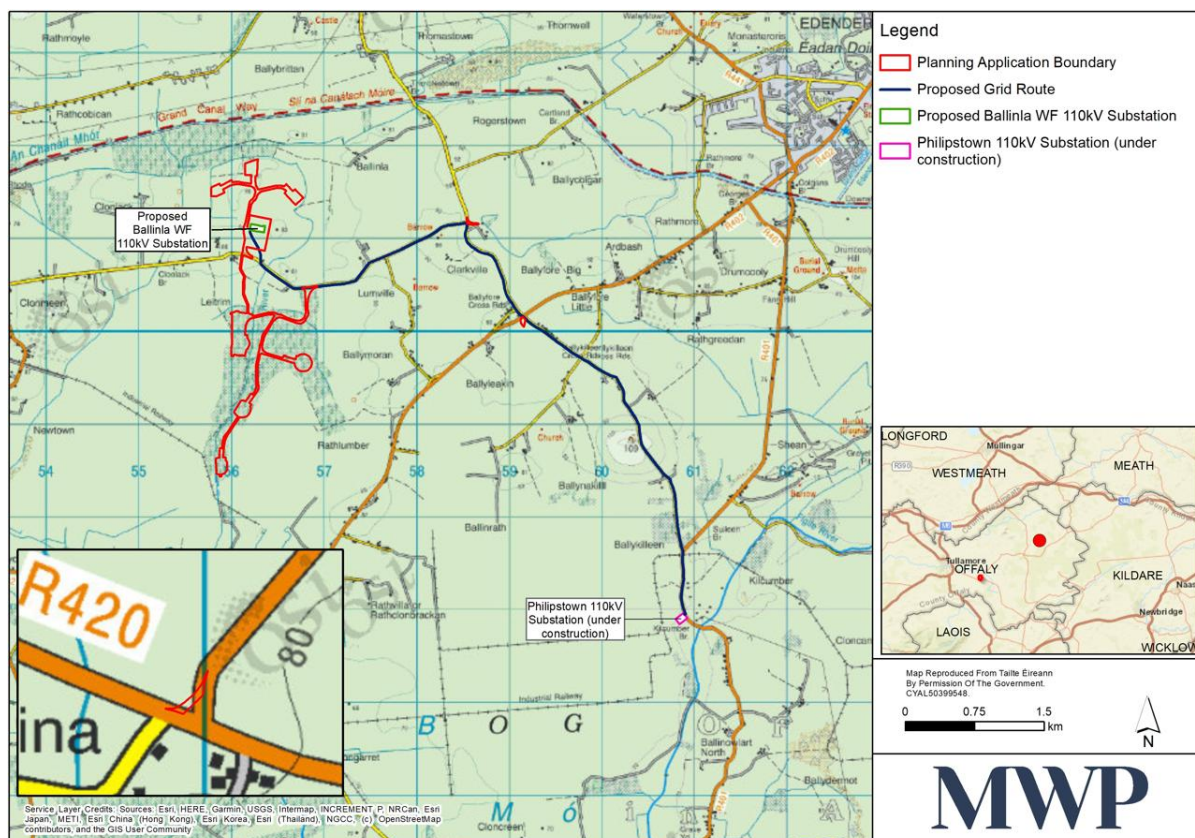


Figure 1. Proposed Development Boundary

3.3 Field Surveys

3.3.1 Habitats and Flora

Habitat surveys were undertaken on the 14th of June 2023 and on the 26th of January 2024, with a re-examination of the habitats undertaken during non-volant mammal surveying undertaken on the 22nd and 23rd of February 2024. The aim of these surveys was to characterise the Proposed Development site and environs and establish the ecological features and resources at the site, particularly in relation to the conservation interests of the SAC/SPA's located within the zone of influence, as outlined in **Section 4.4.1**

Habitats were mapped according to the classification scheme outlined in the Heritage Council publication 'A Guide to Habitats in Ireland' (Fossitt, 2000) and following the guidelines contained in 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011).

Habitat surveys and mapping were considered when identifying ecological constraints during the early design stages of the project. Higher value habitats were avoided from the developable area of the project where possible.

In conjunction with the habitat surveys, botanical surveys were completed within the study area and included a 'look-see' search methodology (NRA, 2009) within habitat features likely to support protected species. This aimed to confirm the presence of plant species considered to be rare in both a national and local context (Scannell and Synnott, 1987), but with particular emphasis on the following:

- The plant species listed in Annex II of the EU Habitats Directive.

- Flora Protection Order species (FPO) (2022).
- Flora species listed in the Irish Red List for Vascular Plants (Wyse Jackson et al., 2016).

Plant nomenclature for vascular plants followed 'Webb's An Irish Flora' (John Parnell and Tom Curtis Eight Edition). Classification of mosses and liverworts followed 'Mosses and Liverworts of Britain and Ireland: a field guide' (Atherton *et al.*, 2010).

During habitat and flora surveys of the study area, any invasive plant species were recorded, with a focus on those species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011). Any infestations encountered were recorded with regard to species, location and extent of infestation, and a photographic record made.

3.3.2 Non-Volant Mammals

The scope of the non-volant mammal (land-based mammals that cannot fly) surveys were informed by the initial ecological surveys carried out across the study area on the 14th of June 2023 and the 26th of January 2024, as well as by species previously recorded in the 10km hectads encompassing the study area.

Surveys to document non-volant mammals onsite were undertaken on the 22nd and 23rd of February 2024. The surveys targeted species protected under the Wildlife Acts 1976 to 2021, as amended, species listed in Annex II, Annex IV and Annex V of the Habitats Directive, and Irish Red Listed species (Marnell *et al.* 2019). Particular focus was given to protected species such as Badger (*Meles meles*), Irish hare (*Lepus timidus hibernicus*), Pine marten (*Martes martes*), and Otter (*Lutra lutra*) in consideration of the type of habitat features present within the study area and the species records listed by the NBDC and NPWS for the identified hectads.

These surveys involved a comprehensive search for all mammal activity in the form of prints, scat, resting/breeding places, feeding signs, mammal trails and direct observations. These surveys had regard to 'Animal Tracks and Signs' (Bang and Dahlstrom, 2004) and 'Ecological Surveying Techniques for Protected Flora and Fauna' (NRA, 2009).

Badger surveys were carried out on the 22nd of February 2024, surveying for badgers followed methodology in 'Surveying for Badgers: Good Practice Guidelines' (Scottish Badgers, 2018).

Otter surveys were carried out with a particular focus given to watercourses within the study area. Surveys of existing stream crossings were completed as part of the mammal surveys conducted on the 22nd and 23rd of February 2024. Survey methodology had regard to 'Monitoring the Otter *Lutra lutra*' (Chanin, 2003a) and 'Ecology of the European Otter' by Chanin (2003b). Otter signs searched for included spraints, footprints, tracks, couches, and holts.

Pine marten surveys were completed as part of the overall non-volant mammal surveys on the 22nd and 23rd of February 2024. Surveys for this species primarily focused on the conifer plantation and woodland areas present within the study area. Any evidence of pine marten activity in the form of scat, prints and resting/breeding places was recorded.

Two trail cameras were deployed within the site on the 22nd of February and were collected on the 9th of March 2024. Trail cameras were deployed under licence (licence no. 227/2023).

3.3.3 Birds

Fehily Timoney and Company (FTC) was appointed by the Applicant to undertake ornithological surveys at the Proposed Development site between 2021 and 2024.

The ornithological surveys included an assessment of bird species occurring within the proposed site boundary, and surveys of surrounding habitats of value to birds. Surveys adhered to Scottish Natural Heritage guidance (SNH, 2017). The following surveys were carried out:

- Vantage Point (VP) Surveys.
- Hinterland Surveys.
- Breeding Bird Transect Surveys.
- Winter Bird Transect Surveys.
- Breeding Wader Surveys.
- Hen Harrier Roost Surveys.
- Nocturnal Migration Audio Surveys for Whooper Swan.
- Whooper Swan Migration Surveys.

3.3.4 Bats

Field surveys were carried out to identify and investigate potential bat roosting features at the proposed wind farm site, along the proposed grid route at points of interest, and along the proposed turbine delivery route. All structures with potential to host roosting bats were inspected visually from ground-level. Roosting features' potential is described according to Collins (2023). In addition, bat activity at the proposed wind farm was investigated using a combination of active and passive bat detector surveys.

A number of surveying methodologies were undertaken to inform the assessment of likely effects of the Proposed Development on bats, including:

- Bat foraging and commuting habitat suitability survey.
- Preliminary Roost Assessment (PRA).
- Nighttime Bat Walkover survey (NBW).
- Passive Automated Bat survey (PAB).

Preliminary Roost Assessment surveys were undertaken on the 23rd of April 2024, nighttime bat walkover surveys were conducted on the 23rd of April, 14th of May, 16th of June and 8th of August, the 3rd of September and the 12th of September. The ground-level static surveys were undertaken over the course of the 2023-2024 bat season.

PAB surveys deployed static units for the summer and autumn seasons of 2023 and for the spring, summer, and autumn seasons in 2024 for ten consecutive nights within each season. Initial PAB surveys across the summer and autumn 2023 seasons determined the majority of bat activity across the site is within the northern section which is possibly influenced by the Grand Canal which may be a valuable commuting and foraging resource for bats in the area. The PRA survey was conducted on the 23rd of April 2024 by a licenced MWP bat surveyor to inspect any buildings, structures and trees which could support roosting bats. PAB survey efforts were initially undertaken to capture data on the extent of bat activity within the site. Consequently, static detectors were deployed across areas in an attempt to capture as much habitat representation across the site as possible.

A daytime walkover survey of farmland in the centre-west of the study area was undertaken on 28th of January 2025 to determine presence of potential roost features and general habitat suitability of this area.

3.3.5 Aquatic Surveys

These field surveys comprised of an evaluation of aquatic habitats, fish assessments and biotic assessment using aquatic macroinvertebrates, as well as onsite physio-chemical water quality measurements. Water quality affects the viability and quality of salmonid habitat so is useful in assessing habitats for aquatic organisms, including trout (*Salmo trutta*) and salmon (*Salmo salar*). To this end, biological sampling and water quality indices were used to

evaluate watercourses at selected locations. This field work was carried out on the 14th and 15th June (biological sampling) and 2nd and 3rd August (electric fishing carried out under license) during 2023. A survey was also undertaken on 26th January 2024 when water levels were higher to determine if any waterbodies within the Proposed Development site drained to the north.

3.4 Screening Assessment

As set out in the NPWS guidance, the task of establishing whether a plan or project is likely to have an effect on a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed through the use of the following key indicators:

- Habitat loss and alteration.
- Disturbance and/or displacement of species.
- Habitat or species fragmentation.
- Water quality.

4. Screening for Appropriate Assessment

The purpose of the screening assessment is to record in a transparent and reasoned manner the direct and indirect likely effects, on relevant Natura 2000 Sites, of the project, either alone or in combination with other plans and projects and whether these likely effects are significant.

Screening for AA (Stage 1) determines the need for a full AA (Stage 2) and consists of a number of steps, each of which is addressed in the following sections of this report:

Section 4.1 Establish whether the project is necessary for the management of a Natura 2000 Site.

Section 4.2 Description of the existing site and the Proposed Development.

Section 4.3 Identification of other plans, projects and activities with which the Proposed Development could interact to create in-combination effects.

Section 4.4 Identification of Natura 2000 Sites potentially affected.

Section 4.5 Identification and description of potential individual and cumulative impacts (in-combination effects) of the Proposed Development.

Section 4.6 and 4.7 Assessment of the significance of the impacts on Natura 2000 Sites.

Section 4.8 Conclusion of screening stage.

4.1 Management of Natura 2000 Sites

The Proposed Development is not connected with or necessary to the conservation management of a Natura 2000 Site.

4.2 Description of the Proposed Development

4.2.1 Site Location and Context

The Proposed Wind Farm is located in a rural area of east Co. Offaly and is approximately 4km west of the Edenderry town boundary and 24km east of Tullamore. **Figure 1** outlines the location of the Proposed Wind Development, the area within the red line boundary is 42ha.

The Proposed Wind Farm is within the townland of Leitrim in the municipal district of Edenderry, Co. Offaly.

The Proposed TDR will include development in the townlands of Leitrim, Ballyfore Big, Ballyleakin, and Ballina (Geashill By) Co. Offaly.

The Proposed Grid Connection will be a linear development within the townlands of Leitrim, Lumville, Ballinla, Clarkeville, Ballyfore Big, Ballyfore Little, Ballyeakin and Ballykilleen, in the local electoral area of Edenderry, Co. Offaly. The Proposed Grid Connection is 8km along the public roads from the Proposed Wind Farm southeast to the existing Philipstown 110kV substation adjacent to the Edenderry Power Station.

Existing land cover at the Proposed Wind Farm consists of agricultural land in the northern section and coniferous commercial forest in the southern section. The Proposed Wind Farm is traversed by the L5010 local road which travels in an east west direction bisecting the Proposed Wind Farm. The Grand Canal is located to the north of the Proposed Wind Farm. The surrounding land includes agricultural fields, forestry and cutover peatlands.

Current land-use along the Proposed TDR and the Proposed Grid Connection comprises of public road corridor, public open space, pastures, mixed forestry and land principally used by agriculture with significant areas of natural vegetation.

4.2.2 Brief Project Description

The Proposed Development to be assessed consists of the following elements:

- Seven Wind Turbine Generators (WTGs) (blade tip height 185m, refer to Table 2-1 for dimensions of each turbine) as shown in **Figure 2**.
- Seven WTG foundations and hardstand areas.
- One electrical substation (110kV) including independent power producer (IPP) substation and wind farm operations compound with associated ancillary buildings, security fencing and all associated works.
- One LiDAR station based on the ground.
- Two new site entrances from the L5010.
- New and upgraded internal site access tracks.
- All associated underground electrical and communications cabling connecting the proposed turbines to the proposed onsite substation.
- The TDR including temporary works on sections of the public road network and private lands along the turbine delivery route on the L-5006 and the junction of the R-402 and R-420.
- One temporary construction site compound and additional mobile welfare unit.
- One spoil deposition area.
- Landscaping.
- Associated surface water management systems.

The project considered in this report includes for an underground grid connection cable connecting the proposed onsite substation to the national electricity grid via the Philipstown 110kV Substation located in the townland of Ballykilleen, Co. Offaly. The cabling will be located within the public road corridor or existing tracks for its entire

length. The total length of the Proposed Grid Connection Route is approximately 8km, the full length of the Proposed Grid Connection Route is located within Co. Offaly. The Proposed Grid Connection crosses one EPA registered watercourse (Leitrim Stream) and one rail crossing. Trenchless installation in the form of horizontal directional drilling (HDD) will be used at both these locations. To ensure clarity, the Proposed Grid Connection Route will be the subject of a separate future planning application.

All elements of the Proposed Development listed above and described in this report have been assessed as part of this AA screening.

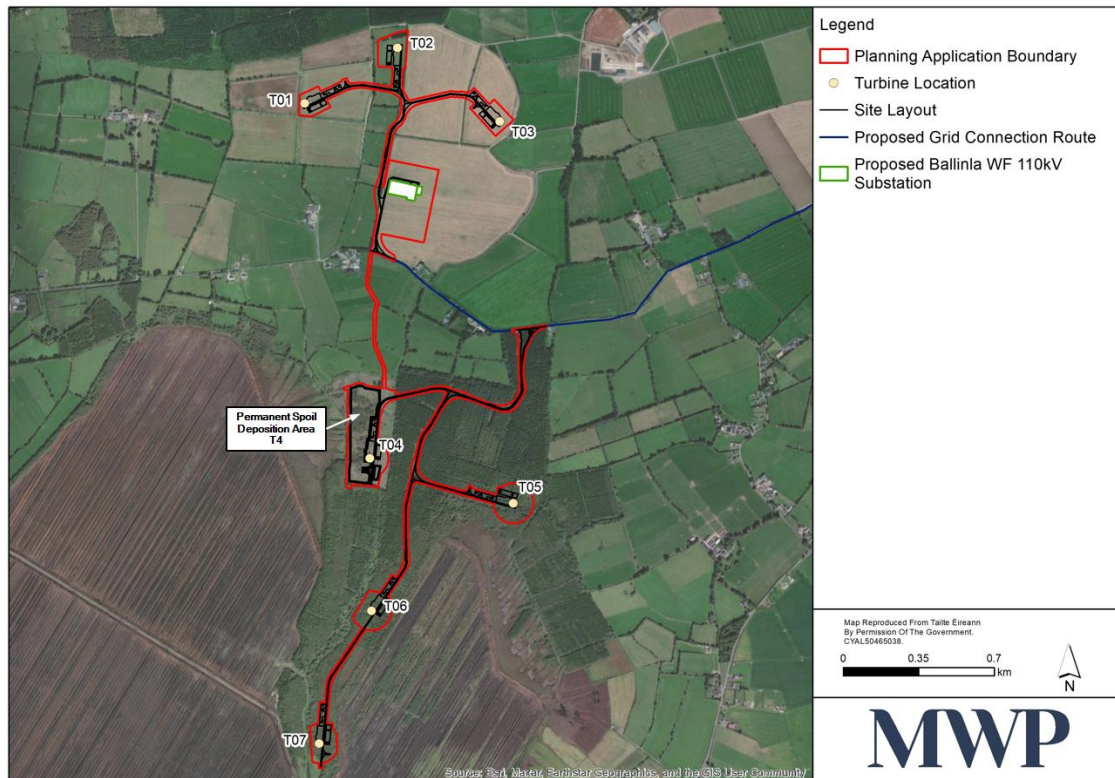


Figure 2: Proposed Wind Farm Layout

4.2.3 Description of Existing Site

4.2.3.1 General Site Description

Existing land cover at the site is a mix of agricultural land and coniferous forests. The surrounding land includes some pastures and lands principally occupied by agriculture. Forestry plantations make up a considerable portion of the south part of the site. The Proposed Development site is zoned 'Rural Area - Structurally Weaker Rural Area' according to the Offaly County Development Plan (CDP) 2021-2027³ and the Offaly County Council Planning GIS Viewer⁴.

³ <https://www.offaly.ie/c/county-development-plan/>

⁴ <https://offaly.maps.arcgis.com/apps/webappviewer/index.html?id=c2f2a84a14e4419e8eae44e09b90b2b>

The CORINE (2018)⁵ landcover data series (available on EPA's interactive map viewer⁶) indicates that landcover at the Proposed Development site is classified primarily as 'Non-irrigated arable land' (Code: 211) and 'Pastures' (Code: 231) with areas of the north and south classified as 'Coniferous forests' (Code: 312) and a small section to the southwest classified as 'Mixed Forests' (Code: 313) and 'Peat bogs' (Code: 412). The predominant land use surrounding the Proposed Development site apart from the urban and industrial areas is classified as 'Pastures' (Code: 231), as shown in **Figure 3**.

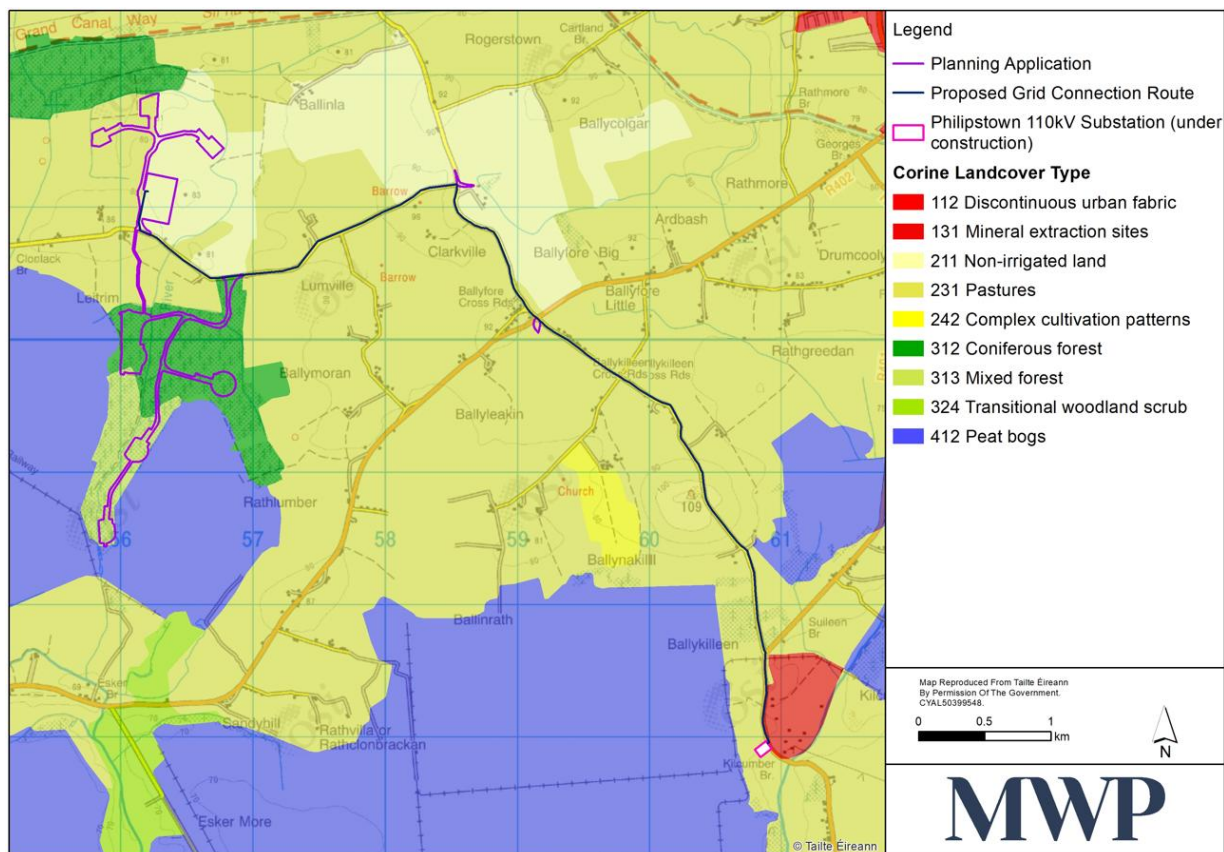


Figure 3. Corine Landcover

4.2.3.2 Hydrology

The Proposed Development lies within the following Water Framework Directive (WFD) River Sub-Basins (as shown in **Figure 4**):

- The Esker Stream_020 (Sub-Catchments: The Figile_SC_020 (Code: 14_14) which is within the Barrow Hydrometric Area (HA 14)).
- The Figile_030 (Sub-Catchment Figile_SC_010 (Code: 14_3)) which is within the Barrow Hydrometric Area (HA 14).
- The Boyne_020 (Sub-Catchment Boyne_SC_010 (Code: 07_4) which is within the Boyne Hydrometric Area (HA 07)).

⁵ Co-ORDinated INformation on the Environment – dataserries established by the European Community available on [EPA Maps](https://gis.epa.ie/EPAMaps/)
Accessed 19/02/2025

⁶ <https://gis.epa.ie/EPAMaps/>

- The Tullamore_020 (Sub-Catchment Tullamore_SC_010 which is within the Lower Shannon Hydrometric Area (HA 25)).

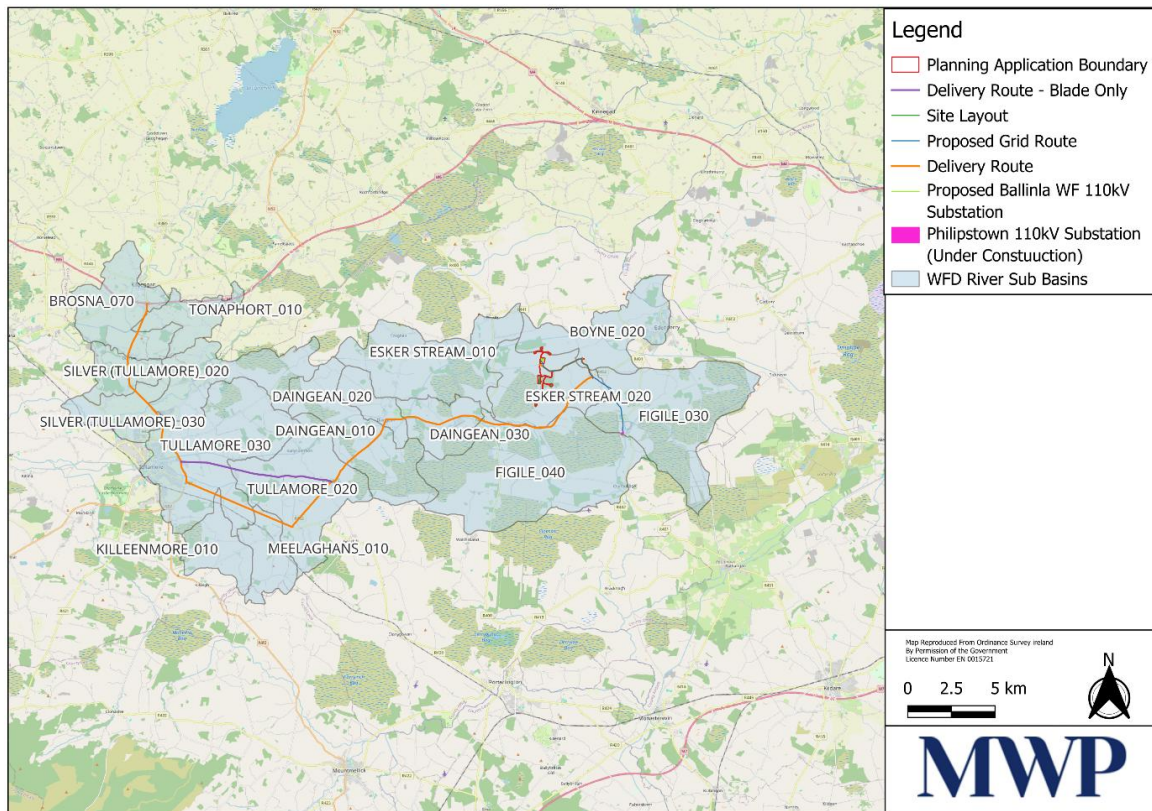


Figure 4. River Sub-Basins

A review of the EPA Online Map Viewer⁷ indicates that two SACs are located downstream of the site. The River Barrow and River Nore SAC (Site Code: 002162) lies approximately 30km downstream of the Proposed Development via the Leitrim Stream and the Figile River. The River Boyne and River Blackwater SAC (Site Code: 002299) lies approximately 25km downstream via the Rogerstown Stream and the River Boyne. **Figure 5** shows the watercourses within the Proposed Wind Farm.

⁷ <https://gis.epa.ie/EPAMaps/>

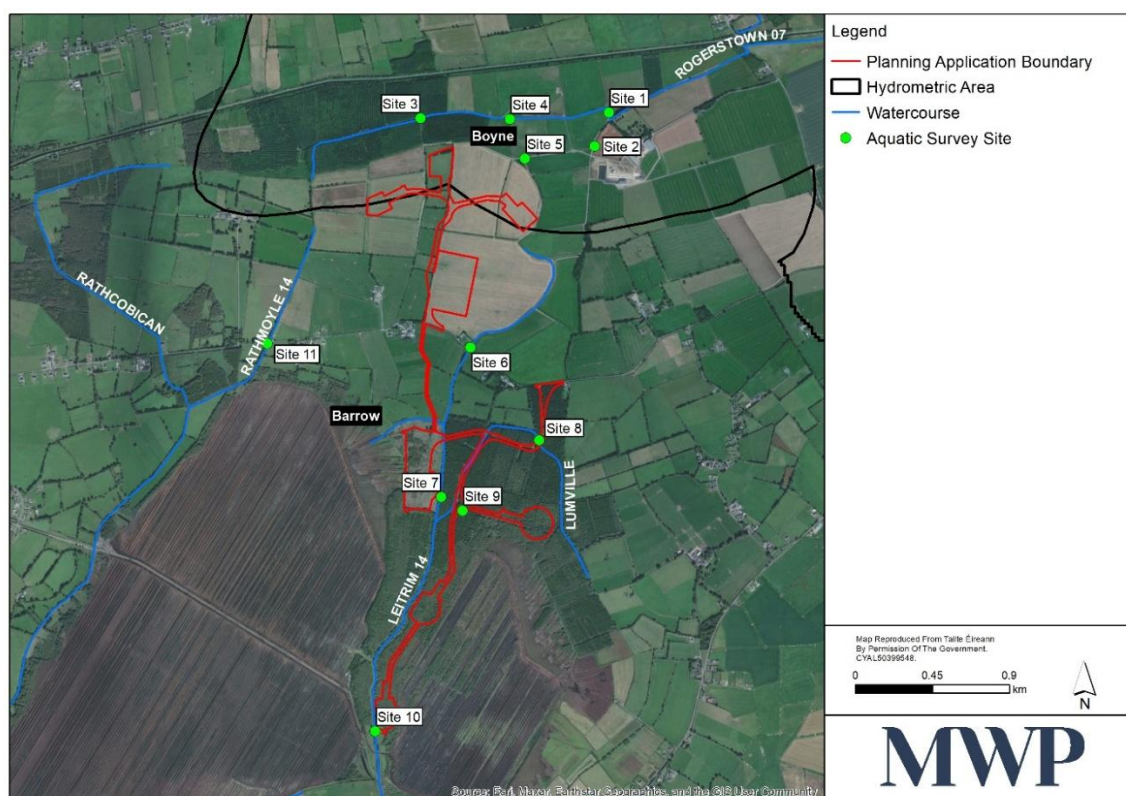


Figure 5. Watercourses in the Vicinity of the Proposed Wind Farm

The Grand Canal is approximately 500m north of the Proposed Development and spans both the River Barrow and River Boyne hydrometric areas and is divided into the Grand Canal Main Line West (Barrow) (Code: IE_14_AWB_GCMLW) and the Grand Canal Main Line (Boyne) (Code: IE_07_AWB_GCMLW). The Grand Canal Main Line West WFD Risk Score is under review and the assigned ecological score for the previous four WFD cycles was recorded as 'Good'. The Grand Canal Main Line West WFD Risk Score is 'Not at Risk' and the assigned ecological score for the previous three WFD cycles was recorded as 'Good'.

EPA mapping shows that the Esker Stream_020 (also known as the Leitrim Stream) drains the central and southern portions of the Proposed Wind Farm. The Boyne_020 drains the northern portion, including the northeastern section of the Proposed Grid Connection, which is referred to as the Kinnafad Stream. The Boyne_020 originates within the Proposed Wind Farm and flows northeast for approximately 9km, discharging into the Boyne_030 (River Waterbody Code: IE_EA_07B040400), and eventually into the Boyne Estuary (Transitional Waterbody Code: IE_EA_010_0100).

The Leitrim Stream begins within the site and flows south for approximately 4.95 km, discharging into the Figile_040 (River Waterbody Code: IE_SE_14F010300), which then flows into the Barrow_090 (River Waterbody Code: IE_SE_14B011000), and ultimately into the Barrow Suir Nore Estuary (Transitional Waterbody Code: IE_SE_100_0100). The southern section of the proposed grid connection drains into the Figile_030 (River Waterbody Code: IE_SE_14F010200), which flows south and joins the Figile_040.

The Ballina (Geashill By) TDR works area drains into the Tullamore_020, which flows north and conflues with the Tullamore_030 (River Waterbody Code: IE_SH_25T030300).

A number of open drainage ditches were identified during the site walkover undertaken by MWP during the aquatic surveys undertaken (14th and 15th June and 2nd and 3rd August 2023 and 26th January 2024). These drainage ditches were connected to the Leitrim Stream. The channels in the northern portion of the site are deep, widened, straight and generally have no significant vegetation within the main channel. The lands drained by

these ditches included areas within the Boyne Catchment as depicted in EPA mapping. It was found these ditches discharge to the Leitrim Stream, the entirety of the wind farm site is considered to drain to the Barrow Catchment. Only a small portion of the Proposed Grid Connection and Ballyfore Big TDR works are likely to drain to the Kinnafad Stream and downstream Boyne catchment. The main channel of the Leitrim Stream in the southern portion of the site is less modified, though the channel is also deep, straight and contains no significant vegetation.

There is no identified direct hydrological connection between the Proposed Development and the Grand Canal. The Rogerstown_07 river crosses the Grand Canal approximately 1km east of Trimblestown Bridge via an under-canal culvert that has been identified with no connection to the canal itself.

4.2.3.3 Hydrogeology

The Teagasc Soils Map available on the GSI website indicates that the Proposed Wind Farm is predominantly underlain by peat, which is classified as having 'poor' drainage. Smaller pockets of limestone-derived till are identified in the northern part of the site. GSI Quaternary Sediment Mapping, also shows that the Proposed Wind Farm site is underlain by a combination of cut-over raised peat and limestone-derived till. The Proposed Grid Connection and Proposed TDR are similarly underlain by limestone-derived till, however, since much of the Grid Connection follows existing public roadways, it is expected that quaternary sediments in these areas will largely consist of made ground.

The bedrock geology of this Proposed Development site is dominated by Edenderry Oolite Member which is described as Oolithic limestone. Waulsortian Limestone are located to the northeast of the Proposed Development site. Lucan Formation is also present on the grid route and at the Ballinla (Geashill By) TDR node to the southwest of the Proposed Wind Farm.

The Edenderry Oolite Member bedrock aquifer beneath the Proposed Wind Farm is mapped as a Locally Important Aquifer (Lm) which is generally moderately productive. The majority of the Proposed Grid Connection is primarily also mapped as a Locally Important Aquifer (Lm) which is generally moderately productive. The southern 1.4km of the Proposed Grid Connection is mapped as a Locally Important Aquifer (LI) which is moderately productive only in local zones. The Proposed Ballinla (Geashill-by) TDR works area is underlain by a Locally Important Aquifer (LI) which is generally moderately productive.

The GSI define groundwater vulnerability as *"...a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities"*. The GSI has assigned a groundwater vulnerability rating of 'Moderate' (M) for the majority of groundwater beneath the Proposed Development (GSI, 2025). The subsoil permeability classification beneath the Proposed Wind Farm and Proposed TDR Nodes is also 'Moderate' (GSI, 2025). Based on the 'Moderate' permeability and 'Moderate' vulnerability rating, the depth to bedrock beneath the site is anticipated to be greater than 10 meters below ground level (mbGL).

4.2.3.4 Field Surveys

4.2.3.4.1 Habitats

No Annex I habitats listed under the Habitats Directive were noted within the Proposed Development and there is no overlap between the extent of development footprint and any Natura 2000 sites. No botanical species protected under the Flora (Protection) Order 2022 or listed in Annex IV of the EU Habitats Directive (92/43/EEC) were recorded. Habitats within the Proposed Development are described in the following subsections using Fossitt (2000) characterisation. A summary of the habitats recorded within the Proposed Wind Farm Study area are shown in **Figure 6..** Photographs of habitats identified are presented **Plate 1 to Plate 11.**

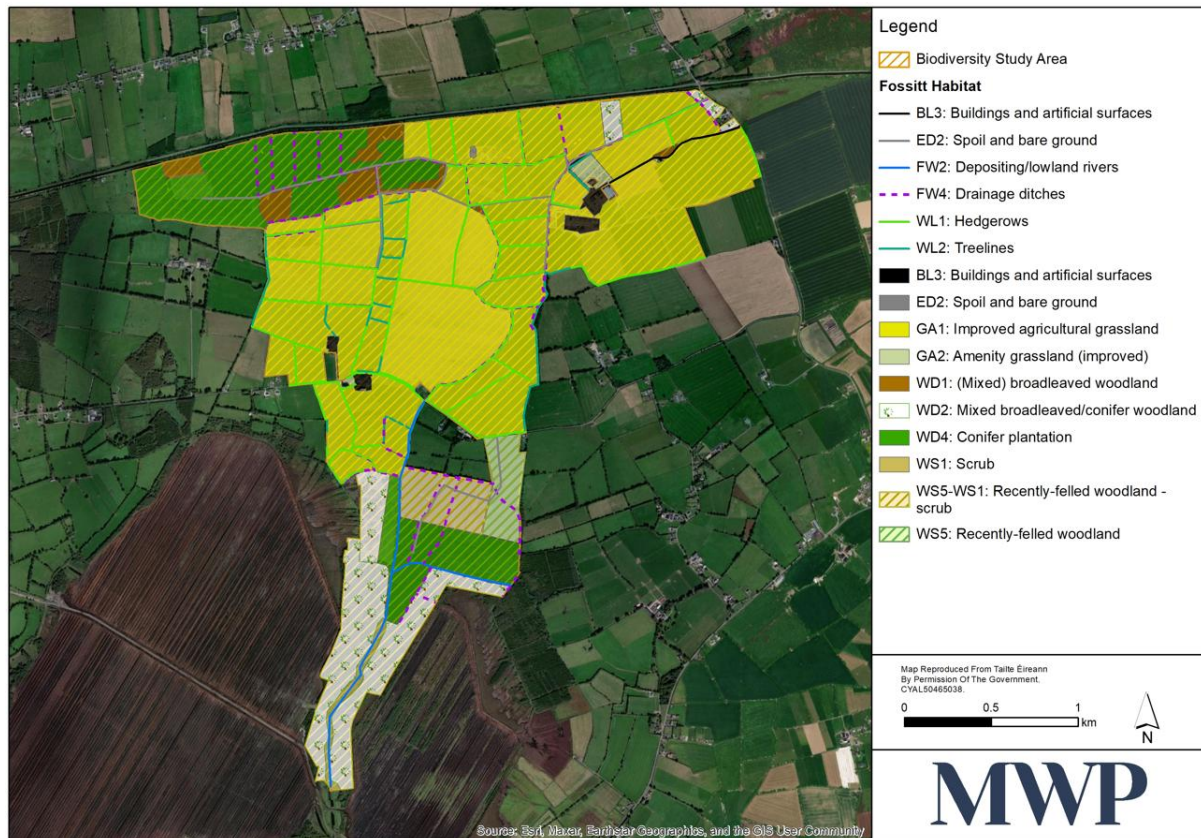


Figure 6. Proposed Wind Farm Biodiversity Study Area Habitat Map

4.2.3.4.1.1 Improved Agricultural Grassland (GA1)

Some areas of this habitat will be removed to facilitate development. This habitat type is the dominant habitat throughout the Proposed Wind Farm and the Proposed TDR nodes along the L-5006. This habitat type is particularly species-poor and dominated by grasses (*Lolium* spp.) due to intensive management of pasture. Species recorded in this habitat included docks (*Rumex* spp.), white clover (*Trifolium repens*) and dandelions (*Taraxacum* spp.). Farmland in the centre-west of the site, on farmland north of the proposed location of turbine T4, supported rushes (*Juncus effusus*) due to poor drainage in this area. This habitat type does not correspond to any EU Habitats Directive Annex I Habitat.



Plate 1. Improved Agricultural Grassland Habitat (GA1) in the Northern Section of the Proposed Wind Farm

4.2.3.4.1.2 Broadleaved Woodland (WD1)

This habitat type occurs in the north of the Proposed Development where it occurs in large sections amongst conifer plantations. Areas of this woodland habitat in the north comprise mainly ash (*Fraxinus excelsior*) and oak (*Quercus* spp.) in varying concentrations and are often bordered by fencing and internal tracks where they occur. Other species occurring in these habitats include buttercup (*Ranunculus repens*), herb robert (*Geranium robertianum*), bluebell (*Hyacinthoides non-scripta*), and ivy (*Hedera hibernica*) with bramble (*Rubus* spp.) also being common. This habitat does not correspond to any EU Annex I habitat.



Plate 2. Broadleaved Woodland (WD1) located in Northwest of the Proposed Wind Farm

4.2.3.4.1.3 Mixed Broadleaved-Conifer Woodland (WD2)

This habitat type occurs within the Proposed Development site either as small woodland areas in the north or as larger assemblages in the south. In the north, small areas of birch (*Betula* spp.) occur in tandem with conifers which have been managed. In the south of the site, this habitat is the dominant habitat where conifer species such as sitka spruce (*Picea sitchensis*) occur alongside beech (*Fagus* spp.), willow (*Salix* spp.), hawthorn (*Crataegus monogyna*) and field maple (*Acer campestre*). The understory is species-poor with bramble (*Rubus*) dominating. Consequently, most of the area in the south of the study area is particularly dense, which limits access, particularly in areas east of the Leitrim watercourse. These areas are relatively managed and are considered to be of relatively low ecological value.



Plate 3. Mixed Broadleaved-Conifer Woodland (WD2) in South of the Proposed Wind Farm

4.2.3.4.1.4 Conifer Plantation (WD4)

This habitat is one of the dominant habitat types within the study area. Conifer plantation within the study area is limited to two main areas, one in the northwest of the study area with the second located within the southern area of the Proposed Wind Farm. These areas are planted with Norway spruce (*Picea abies*) and sitka spruce (*Picea sitchensis*). This habitat has been planted for commercial forestry and diverse flora is absent. Rows of deciduous trees are often planted along the edges of this habitat type to increase biodiversity such as beech (*Fagus sylvatica*). This habitat does not correspond to any EU Annex I habitats.

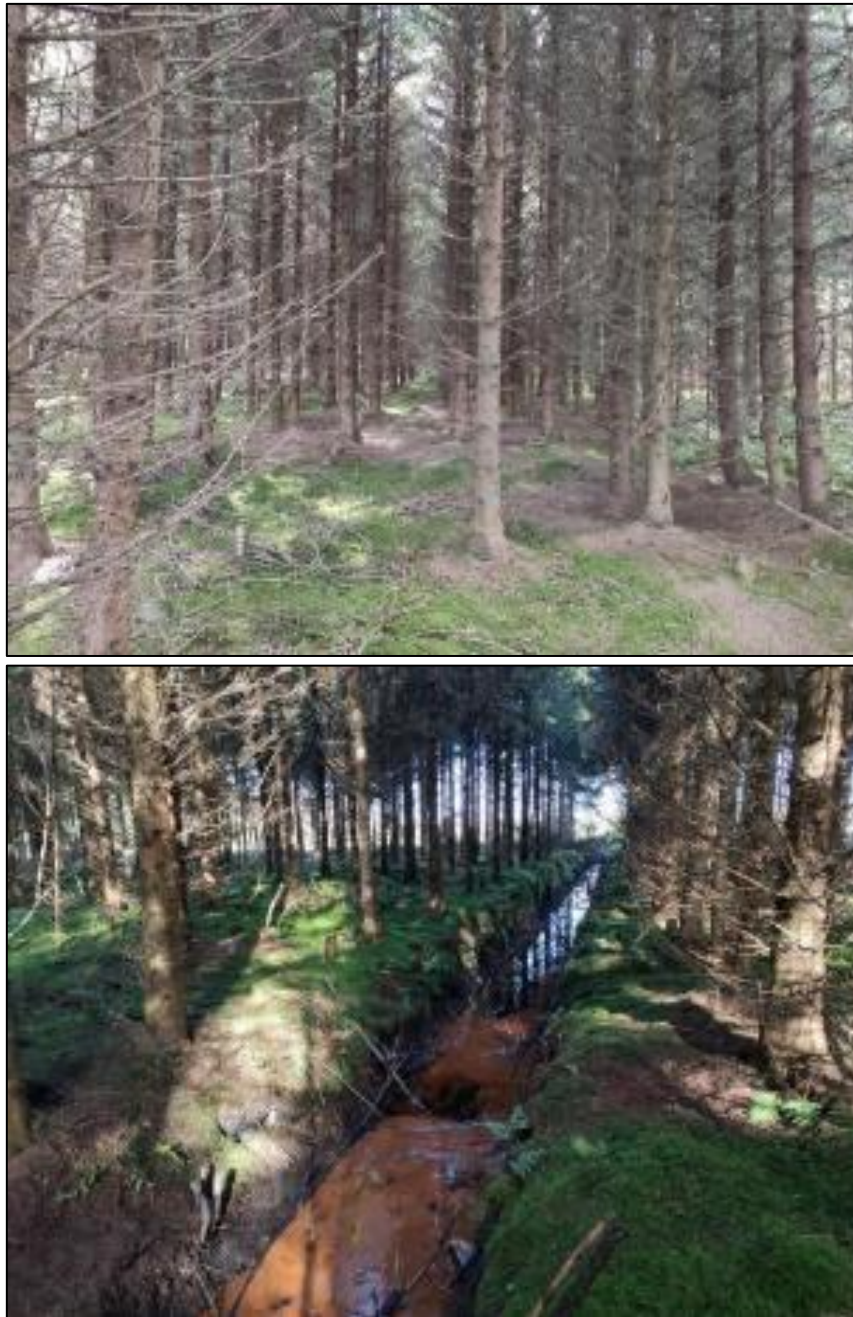


Plate 4. Conifer Plantation (WD4) in South Area of the Proposed Wind Farm (top) and Northwest Portion (bottom) of Study Area with Drainage Ditch (FW4)

4.2.3.4.1.5 Scrub (WS1)

This habitat occurs in the south of the study area, along the lower reaches of the Leitrim River, and includes the immediate bankside area which has graded from grassland to the immediately located fringing Mixed Broadleaved-Conifer Woodland (WD2). This area is dense, particularly for the length of the eastern bank, and is composed of hawthorn (*Crataegus monogyna*), willow (*Salix spp.*), birch (*Betula spp.*), and bramble (*Rubus fruticosus*). The areas to the immediate east and west of the bankside are particularly dense forming a narrow corridor of habitat along the river's banks; mammal trails were found along the eastern bank indicating mammals may use this habitat as a corridor for commuting between areas.



Plate 5. Dense Scrub (WS1) habitat along bank of Leitrim River in the South of the Proposed Wind Farm

4.2.3.4.1.6 Recently Felled Woodland (WS5)

Recently felled woodland occurs in the central southeast of the Proposed Wind Farm. This area was previously planted with sitka spruce and Norway spruce and has been recently felled. The ground was highly disturbed when surveyed in February 2024. The ecological value of both mature and recently felled commercial woodland are both considered to be of low ecological value.



Plate 6. Recently Felled Woodland (WS5) in the Central Southeast of the Proposed Wind Farm

4.2.3.4.1.7 Spoil and Bare Ground (ED2)

This habitat comprises a spoil area in the north of the study area and unpaved roadways which demarcate field boundaries in areas. This habitat is disturbed and does not constitute a habitat of any ecological value within the site.



Plate 7. Spoil and Bare Ground (ED2) Habitats in North for the Proposed Wind Farm, Bare Track (Left) and Infilled Area (Right)

4.2.3.4.1.8 Buildings and Artificial Surfaces (BL3)

This habitat type is limited to farm holdings (farmyards) which are located together in the northeast of the study area. These structures are highly modified and have little capacity to support floral vegetation due to their continued use. None of the structures listed above will be removed to facilitate the development of the Proposed

Wind Farm. No demolition or change of use of these buildings is considered to occur as a result of the Proposed Development.

This habitat type also occurs along the existing public road network within the study area of the proposed TDR and the Proposed Grid Connection. It comprises hard artificial surfaces including tarmac and concrete, typically bordered by kerbing and drainage infrastructure. These areas are subject to frequent vehicular traffic and maintenance, resulting in minimal vegetation cover. However, occasional colonisation by ruderal or disturbance-tolerant species such as annual meadow grass (*Poa annua*), mosses (*Bryum* spp.), and dandelion (*Taraxacum officinale*) may occur in cracks or along the road margins.

This habitat is classified under Fossitt as BL3 – Buildings and artificial surfaces and does not correspond to any EU Annex I habitat.

No demolition or change of use of these buildings is considered to occur as a result of the Proposed Development.

4.2.3.4.1.9 Depositing Lowland River (FW2)

The Leitrim River is classified as a depositing/lowland river in the southern extent of the study area and drains watercourses to the south of the site. A naturalised land drain runs east to west in the southern area of the study area, bisecting conifer and mixed broadleaved-conifer woodland habitats. The channel width ranges from approximately 1.5m to 4.7m.

An additional length of this habitat type was identified during surveying in the southwest of the study area on the 28th of January 2025. This habitat was slow flowing and in-water conditions were noted to be degraded at this location when compared with other examples in the study area. The length of this first order stream is approximately 360m to the river head where it originates in extracted bogland and is fed by at least two drainage ditches along its north bank. Flow in this watercourse was notably very slow along its length. This watercourse runs west to east where it joins the Leitrim stream in the south of the study area. This channel width ranges from approximately 1m to 1.5m in width.

Watercourses draining the site collectively support fool's watercress (*Apium nodiflorum*), brooklime (*Veronica beccabunga*), watercress (*Rorippa nasturtium-aquaticum*), lesser water-parsnip (*Berula erecta*), water starwort (*Callitriche* sp.), reed canary grass (*Phalaris arundinacea*) and great willowherb (*Epilobium hirsutum*).

Additionally, there is wide riparian vegetation throughout the site, which is dominant and dense with 100% soil cover, providing a natural filtration of sediments from run-off sources. The vegetation structure adjacent to these waters systems includes several broadleaf trees, heavy scrub (WS1) and tall grasses.



Plate 8. Depositing Lowland River (FW2) along Leitrim River in south of study area (left) and in woodland in centre of study area (right)



Plate 9. Depositing Lowland River (FW2) in the Southwest of the Proposed Wind Farm looking Upstream (Left) with Indications of Nutrient Enrichment along its Length (Right)

4.2.3.4.1.10 Drainage Ditch (FW4)

Drainage ditches are located extensively throughout the northern extent of the study area which have been created historically for land drainage purposes. These habitats occur often at the edge of field boundaries but also within conifer plantation habitats. Flows in drainage ditches in the site were often imperceptible as the low gradient of the surrounding area provides little natural flow by way of gravity. Slow flows allow duckweed (*Lemna* sp.) to proliferate where conditions are particularly still.

This habitat has low ecological value for aquatic species such as fish and limited value for frog as spawning habitat. Tadpoles were identified at one drainage ditch in June 2023, though no successful frog spawning was recorded at the site when surveyed in February 2024.



Plate 10. Drainage ditch (FW4) in Centre of Study Area

4.2.3.4.1.11 Hedgerows (WL1) and Treelines (WL2)

Hedgerows and treelines are located exclusively in the northern section of the Proposed Wind Farm, delineating field boundaries and bordering access tracks and local roads, and adjoining ditches. These habitats also occur along the Proposed Grid Connection and at the Proposed TDR nodes along the L-5006. These habitat types generally link up, sometimes transitioning from one to the other along the same linear feature.

Treeline habitat mainly comprises single rows of ash (*Fraxinus excelsior*) pitched as field boundaries in the northwest of the study area. Treelines are focused in the northwest of the study area where most mature trees are present. Hedgerows are typically comprised of willow (*Salix* spp.), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) with ivy (*Hedera helix*) and an understory of bramble (*Rubus fruticosus*) and nettle (*Urtica dioica*). The species richness of hedgerows within the site were relatively species poor and were typically highly managed. This habitat type does not correspond to any EU Annex I habitats.



Plate 11. Hedgerow (WL1) (left) and Treeline (WL2) (right) in the North of the Proposed Wind Farm

4.2.3.4.1.12 Roadside Grass Verge (GS2)

This habitat type occurs along the margins of public roads and access tracks within the study area of the Proposed Development, most notably within the Proposed Grid Connection and Proposed TDR node at the junction of the R-402 and R-420. It typically comprises a narrow strip of semi-natural grassland maintained by regular mowing or disturbance. Dominant species include perennial ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), and creeping bent (*Agrostis stolonifera*), with frequent occurrences of daisy (*Bellis perennis*), dandelion (*Taraxacum officinale*), and clover (*Trifolium repens*). Occasional ruderal species such as broad-leaved plantain (*Plantago major*) and nettle (*Urtica dioica*) may also be present, particularly in more disturbed areas. This habitat is classified under Fossitt as GS2 – Dry meadows and grassy verges and does not correspond to any EU Annex I habitat.

4.2.3.4.2 Rare and Protected Flora within the Study Area

4.2.3.4.2.1 Desk Study

The desktop study included a review of data held by the NBDC and the NPWS for the relevant hectads and the townland of Ballina (Geashill By). The search targeted plant species listed under the EU Habitats Directive, Flora Protection Order species (FPO) (2022), and species listed in the Irish Red List (Wyse Jackson, *et al.* 2016). Species records are listed in **Table 1**. None were found in the Ballina (Geashill By) townland.

Table 1. Documented Records of Protected Flora Species within Relevant Hectads

Name	Record Date	Designations and Status	Habitat Requirements (Curtis and McGough, 1988) ^{8,9}	Hectad	Record Source
Basil Thyme (<i>Clinopodium acinos</i>)	2021	FPO, Red List: Near Threatened	Exposed esker ridges, dry calcareous grassland, sandy soils, and arable field edges.	N52, N62	NBDC, NPWS
Ceruous Thread-moss (<i>Bryum uliginosum</i>)	1915	FPO, Red List: Endangered	Wet acidic soils, bogs, and damp heathland.	N42	NBDC
Common Extinguisher-moss (<i>Encalypta vulgaris</i>)	1915	Red List: Near Threatened	Exposed calcareous rocks, walls, and dry banks.	N42	NBDC
Corn Marigold (<i>Glebionis segetum</i>)	2019	Red List: Near Threatened	Arable fields, disturbed soils, and field margins; prefers light, sandy or loamy soils.	N42	NBDC
Dropwort (<i>Filipendula vulgaris</i>)	2019	Red List: Vulnerable	Dry calcareous grasslands, often on limestone; well-drained soils.	N42	NBDC
Frog Orchid (<i>Coeloglossum viride</i>)	2009	FPO	Unimproved calcareous grasslands, limestone pavements, heathy grasslands and montane grassland; often occurs in thin soils on upland slopes, eskers, and limestone ridges.	N62	NPWS
Green-winged Orchid (<i>Anacamptis morio</i>)	2022	Red List: Vulnerable	Unimproved calcareous and neutral grasslands, meadows, and pastures on free-draining soils, and light sandy or loamy soils in lightly grazed or mown grassland.	N42, N52, N62	NPWS

⁸ https://www.npws.ie/sites/default/files/publications/pdf/Curtis_1988_PlantsRedBook.pdf

⁹ <https://www.irishwildflowers.ie/habitats.html>

Name	Record Date	Designations and Status	Habitat Requirements (Curtis and McGough, 1988) ^{8,9}	Hectad	Record Source
Least Bur-reed (<i>Sparganium natans</i>)	2013	Red List: Near Threatened	Shallow water of lakes and slow-flowing rivers, often in peaty or sandy substrates.	N62	NBDC
Opposite-leaved Pondweed (<i>Groenlandia densa</i>)	2011	FPO, Red List: Near Threatened	Occurs in slow-flowing rivers, canals, and drainage ditches, and in mesotrophic to eutrophic lakes; prefers calcareous waters and fine silty substrates.	N42	NPWS
<i>Pyrola rotundifolia</i> subsp. <i>rotundifolia</i>	2024	Red List: Near Threatened	Open woodland, damp sandy or calcareous soils, often in conifer plantations or pinewoods.	N52, N53, N62	NBDC, NPWS
Red Hemp-nettle (<i>Galeopsis angustifolia</i>)	1999	FPO, Red List: Endangered	Dry sandy fields, arable margins, and disturbed calcareous soils.	N53, N62	NBDC, NPWS
Round-leaved Wintergreen (<i>Pyrola rotundifolia</i>)	2022	Red List: Near Threatened	Open woodland, sandy or calcareous soils, sometimes in heath or grassland.	N52, N62	NBDC
Slender Tufted-sedge (<i>Carex acuta</i>)	2001	Red List: Near Threatened	Margins of lakes and rivers, fens, and marshy ground.	N52, N53	NBDC
Upright Brown Grimmia (<i>Schistidium strictum</i>)	1907	Red List: Near Threatened	Acidic rock outcrops, stone walls, and upland scree.	N42	NBDC

4.2.3.4.2.2 Field Survey

The Proposed Wind Farm is dominated by conifer plantation and intensively managed agricultural grasslands in the north, with the southern area characterised by mixed conifer broadleaved woodlands and recently clear-felled areas.

The Proposed TDR and Proposed Grid Connection are predominantly characterised by artificial surfaces associated with public roads (BL3), with adjoining habitats comprising roadside grassy verges (GS2), managed hedgerows (WL1), and improved agricultural grasslands (GA1). These habitats are typical of lowland rural infrastructure corridors and reflect a landscape shaped by intensive land use and transport infrastructure. Vegetation along the verges and hedgerows provides limited ecological connectivity, while the grasslands are generally species-poor and regularly maintained.

No rare or protected flora species, including any of those listed in **Table 1**, were recorded during ecological surveys undertaken in the study area. While the lack of evidence of a protected species does not necessarily preclude its presence at the site either at this current time or in the future, the highly altered habitats in the area within the study area considered in combination with the species' habitat requirements as described by Curtis and McGough, 1988, indicate a lack of suitable habitat within the study area for any of the species to occur.

4.2.3.4.3 Non-Volant Mammals

4.2.3.4.3.1 Desk Study

Records of protected fauna were retrieved from the NBDC database for relevant hectads and information received from the NPWS data request for rare and protected species were reviewed. These records are listed in **Table 2**.

Table 2. Records of Protected Non-Volant Mammals from Relevant Hectads

Common Name	Species Name	Level of Protection	Hectad	Record Origin
Badger	<i>Meles meles</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N42/N52/N53/N62	NBDC, NPWS
Eurasian Pygmy Shrew	<i>Sorex minutus</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N42/N52/N53/N62	NBDC, NPWS
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N42/N52/N53/N62	NBDC, NPWS
European Otter	<i>Lutra lutra</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000); EU Habitats Directive (92/43/EEC) Annex II, Annex IV	N42/N52/N53/N62	NBDC, NPWS
Hedgehog	<i>Erinaceus europaeus</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N42/N52/N53/N62	NBDC, NPWS
Irish Hare	<i>Lepus timidus hibernicus</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000); EU Habitats Directive (92/43/EEC) Annex V	N42/N52/N53/N62	NBDC, NPWS
Pine Marten	<i>Martes martes</i>	EU Habitats Directive (92/43/EEC) Annex V	N42/N52/N53/N62	NBDC, NPWS
Stoat	<i>Mustela erminea</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N53	NBDC, NPWS

4.2.3.4.3.2 Field Survey

No evidence of otter was found during surveys, though there was one instance of suspected otter scat recorded along the banks of the Leitrim River in the south of the study area site. No otter holts, couches or slides were found along this watercourse, though species may likely be using the aquatic corridor for foraging purposes.

Irish Hare (*Lepus timidus*) was present in vegetated areas and was noted in the northeast of the site study area on the fringes of mixed woodland and in the centre of the site amongst the clear-felled conifer plantation.

No additional non-volant mammal species were identified during surveying of the site.

4.2.3.4.4 Freshwater Aquatic species

4.2.3.4.4.1 Desk Study

In order to collate information on aquatic species and to identify features of aquatic ecological importance within the study area, a desk-top study was undertaken.

Aquatic species recorded in the relevant hectads are listed in **Table 3**. The influence of the Boyne catchment to the north of the Proposed Development site is likely driving the presence of lamprey and salmon in N53. Though white-clawed crayfish has been recorded in N52 and N53, EPA biological sampling did not return records for the species in 2022.

Table 3. Documented Records of Freshwater Aquatic Species within Relevant Hectads within the Study Area

Common Name	Species Name	Level of Protection	Hectad	Record Origin
Common Frog	<i>Rana temporaria</i>	EU Habitats Directive (92/43/EEC) Annex V; Wildlife Acts	N42/N52/N53/N62	NBDC, NPWS
Smooth Newt	<i>Lissotriton vulgaris</i>	Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)	N42/N53/N62	NBDC, NPWS

Common Name	Species Name	Level of Protection	Hectad	Record Origin
White-clawed Crayfish	<i>Austropotamobius pallipes</i>	EU Habitats Directive (92/43/EEC) Annex II, Annex V; Wildlife Acts	N42/N52/N53/N62	NBDC, NPWS

4.2.3.4.4.2 Field Study

As part of the aquatic baseline surveys, extensive surveying of the watercourses within the Proposed Development was undertaken. Surveying found that the Leitrim River within the Proposed Development is not utilised by spawning salmonids due to its small size and slow flowing watercourse. Despite brown trout being found in the Leitrim River itself, those found were deemed to have spawned in the Esker River located downstream. Other species found in the watercourses draining the study area included three-spined stickleback (36), brown trout (15), minnow (41), pike (2), dace (4), perch (1), and brook lamprey (1). Salmonids were absent from all sites with the exception of Site 10 (Leitrim River) and 12 (Esker stream) due to a lack of habitat suitability, but also partly due to water quality, with these two features being interrelated in small channels draining the site. Overall, the biological water quality is considered to be largely compromised within the study area which suggests an unstable aquatic ecosystem in smaller channels within the site attributed to loss of soils to streams and associated enrichment relating to agriculture and coniferous forestry, albeit to a lesser degree.

Although a single juvenile brook lamprey (*Lampetra planeri*) was recorded during electrofishing within the Leitrim Stream, this isolated observation does not indicate the presence of a significant or sustainable population. The stream is characterised by silty substrate, low flow velocity, and moderate enrichment—all of which limit its suitability as a spawning or long-term habitat for lamprey. The species is known to require clean, gravelly substrate for spawning and finer sediment for larval burrowing, conditions which were largely absent in the surveyed section. Therefore, the site is considered suboptimal for supporting a viable brook lamprey population.

4.2.3.4.5 Invasive Alien Species

4.2.3.4.5.1 Desk Study

A search for invasive plant species recorded in the NBDC database for hectads N42, N52, N53 and N62, encompassing the study area, was undertaken with a focus on non-native plant species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). Documented high-impact invasive plant species from the Third Schedule include Butterfly-bush (*Buddleja davidii*) in N42 and N52, Canadian Waterweed (*Elodea canadensis*) in N42 and N52, Himalayan Balsam (*Impatiens glandulifera*) in N42, Japanese Knotweed (*Fallopia japonica*) in N42, N53 and N62, Rhododendron (*Rhododendron ponticum*) in N42, N52 and N53, and Traveller's-joy (*Clematis vitalba*) in N53. The only non-native invasive plant species recorded that is not listed under the Third Schedule was Sycamore (*Acer pseudoplatanus*), present in all four hectads (N42, N52, N53, N62). Additional non-native plants with invasive potential but requiring confirmation for scheduling included Nuttall's Waterweed (*Elodea nuttallii*), Russian-vine (*Fallopia baldschuanica*), Spanish Bluebell (*Hyacinthoides hispanica*), Cherry Laurel (*Prunus laurocerasus*), and Douglas Fir (*Pseudotsuga menziesii*), all recorded in at least one of the four hectads.

A search for invasive faunal species within the same hectads, focusing on Third Schedule non-native animals, identified Eastern Grey Squirrel (*Sciurus carolinensis*) in all four hectads, Zebra Mussel (*Dreissena polymorpha*) in N42 and N53, Brown Rat (*Rattus norvegicus*) in N42 and N52, Fallow Deer (*Dama dama*) and European Rabbit (*Oryctolagus cuniculus*) in all four hectads. Additional Third Schedule mammals recorded included American Mink (*Neovison vison*) in N42, N52, N53 and N62. Other invasive animal species not listed under the Third Schedule included Greater White-toothed Shrew (*Crocidura russula*), Feral Goat (*Capra hircus*), House Mouse (*Mus*

musculus), various non-native snails (*Cornu aspersum*, *Potamopyrgus antipodarum*, *Xeroplexa intersecta*) and slugs (*Tandonia budapestensis*, *Tandonia sowerbyi*), and the amphipod *Gammarus pulex/fossarum* aggregate.

4.2.3.4.5.2 Field Study

During ecological field surveys, no invasive plant species were positively identified within the study area. A field camera was deployed in the north of the Proposed Wind Farm near the entrance to a suspected mustelid den entrance on the 3rd of February 2024. This camera picked up images, albeit unclearly, of a large mustelid. The images obtained indicate American mink (*Neovison vison*), due to a lack of any obvious bib of pale cream fur colour in images and a tail indicating a species other than pine marten. Due to records of the species within the area, it is considered the species recorded on cameras is American mink, an invasive animal species designated under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015).

4.2.3.4.6 Birds

4.2.3.4.6.1 Desk Study

As part of the data request information received from NPWS via the data request, records of protected and threatened species provided for the hectads N62, N52, N53 and N42 included for curlew (*Numenius arquata*) (nest/territory in N62, 2016), Peregrine Falcon (*Falco peregrinus*) (occupied nest sites in N53 and N62, recorded during the 2002 and 2017 national surveys), and Greenland White-fronted Goose (*Anser albifrons*) records within the study hectads.

4.2.3.4.6.2 Field Study

A comprehensive programme of ornithological surveys was undertaken to assess the potential impacts of the Proposed Development on bird species. These surveys, conducted between April 2021 and January 2025, included vantage point (VP) surveys, hinterland surveys, breeding and winter bird transects, breeding wader surveys, hen harrier roost watches, and nocturnal migration audio surveys for whooper swan. All work followed best practice guidance from SNH (2017), EPA (2022), and CIEEM (2018).

VP surveys were conducted across all seasons and also included migration periods. Four VPs giving 100% coverage of the 500m turbine layout buffer were used to monitor bird flight activity, including flight height, direction, and duration.

The following target species were recorded during VP surveys and/or hen harrier roost watches:

- Black-Headed Gull
- Buzzard
- Common Gull
- Cormorant
- Great Black-backed Gull
- Golden Plover
- Grey Heron
- Greylag Goose
- Hen Harrier
- Kestrel
- Lapwing
- Lesser Black-backed Gull
- Little Egret
- Little Grebe

- Mallard
- Mute Swan
- Redshank
- Peregrine
- Short-eared Owl
- Snipe
- Sparrowhawk
- Whooper Swan

A further three target species which were not recorded during VP or hen harrier roost watch surveys were also observed:

- Kingfisher (recorded during hinterland surveys on one occasion)
- Ringed Plover (recorded during breeding wader surveys on one occasion)
- Woodcock (recorded during breeding wader/woodcock surveys)

Hen harrier activity was limited to wintering birds, with the majority of records noting foraging birds. There were three records of casual/opportunistic roosting in wooded habitats near the proposed development; however, no habitual or group roosting indicative of an established hen harrier winter roost was observed.

A wintering golden plover population is present in the area in which the proposed development is located. Large flocks were observed, and flocks of up to 1,000 individuals were observed within the flight activity study area. The majority of activity was concentrated in agricultural land to the east of the northern section of the Proposed Development, and to the east of the southern section around Esker Bog Rathlumber. A flock of 1,500 golden plover was also observed at hinterland survey site HVP8 at Rathvilla Quarry Ponds to the southeast of the proposed development.

The local lapwing population observed during surveys includes both wintering birds and a smaller number of resident birds/summer visitors. Surveyors noted lapwing display flights over Esker Bog Rathlumber (east of proposed development) and breeding attempts near VP3 but noted breeding success was unlikely due to high predator pressure (resident foxes, hooded crows and magpies were frequently observed, and pine marten and mink are also likely to be present). No evidence of successful breeding on Esker Bog Rathlumber was recorded.

The detection of nocturnal whooper swan flight calls is indicative of some migratory movements through the area in which the Proposed Development is located, while observations from visual surveys confirm the presence of a dispersed and mobile wintering population in the region. Whooper swans were occasionally observed flying over the Proposed Development. Flocks of whooper swan were noted grazing in agricultural land near T3 on two dates in the same week during winter 2022-23 surveys, and other groups were seen roosting/grazing on Esker Bog (west of proposed development) during winter 2023-24 surveys. These were isolated observations of casual roosting and grazing; however, no habitual grazing or roosting sites were observed in the vicinity of the Proposed Development. The primary night roost in the wider area is considered to be at Derryarkin, located 8.3km northwest of the Proposed Development. It is also likely that night roosting also occurs at dispersed locations in the wider area.

Snipe were recorded during surveys, and observations of drumming birds indicate this species breeds on the cutover bogs to the east and west of the proposed development.

Woodcock were recorded in woodland beside the Grand Canal to the north-west of T1 during summer 2021, and breeding behaviour (display flights) were noted near T4 during summer 2022 surveys.

Kingfisher was recorded on one occasion during hinterland surveys to the north of TR18 (c. 4.2km west of the Proposed Development), confirming the presence of this species in the wider area. There is no potentially suitable kingfisher nesting or foraging habitat within the Proposed Development.

Ringed plover was recorded as potentially breeding in the surrounding hinterland during summer 2021 breeding wader surveys, which extended to the surrounding hinterland. Indications of breeding were recorded at Site 2 (4.7km west of Proposed Development).

4.2.3.4.6.3 Hen Harrier

Hen harrier were observed during the winter season only, with the majority of observations noting foraging or commuting birds. There were three records of casual/opportunity roosting in wooded habitats near the proposed development; however, no habitual or group roosting indicative of an established hen harrier winter roost was observed. The timing, observed behaviour and presence of numerous different individual birds are indicative of use of the Proposed Development by a varied and dispersed wintering population. Hen harrier breed in upland areas, with most dispersing to overwinter in lowland habitats. While some birds remain to overwinter in breeding areas, many hen harriers leave the upland breeding territories to disperse and range widely in the lowlands during winter, including coastal areas.

Breeding hen harrier favour upland habitats including scrub, heath and pre-thicket conifer plantation. The nearest breeding hen harrier stronghold is the Slieve Bloom Mountains c. 25 km south of the Proposed Development (designated as an SPA for hen harrier, with all conservation objectives linked to the breeding population within the SPA). The core and maximum foraging ranges of breeding hen harrier are 2km and 10km respectively (SNH, 2016), placing the Proposed Development beyond the distance where indirect effects on the SPA breeding population could potentially occur. It is noted that the R420/R402 TDR node is located 11.9km from the Slieve Bloom Mountains SPA, placing it outside the core foraging range of 10km. Since the location of the Proposed Development is beyond the potential zone of influence for effects on the SPA breeding population, wide dispersal of wintering birds and absence of conservation objectives relating to the winter season, there are no defined links between wintering birds observed onsite and SPAs designated for hen harrier.

4.2.3.4.6.4 Migratory species

As part of this assessment the potential for migratory activity of migratory SCI species for SPAs in the wider region was examined. A total of seven potential migratory species, which are also named SCIs for SPAs in the wider region, were recorded during surveys for the Proposed Development (see **Table 4**).

The detection of nocturnal whooper swan flight calls is indicative of some migratory movements through the area in which the Proposed Development is located, while observations from visual surveys confirm the presence of a dispersed and mobile wintering population in the region. While there are a number of SPAs in the wider region which include whooper swan as an SCI, none occur in proximity to the Proposed Development, with the closest (Lough Derravarragh SPA) located 32km northwest, and three other SPAs located to the northwest and west at distances ranging from 34km to 50km from the Proposed Development. Considering the direction of arrival for wintering whooper swans coming from Iceland is from the north, swans migrating to winter at these SPAs (see Table X) would be unlikely to traverse the Proposed Development en route. For whooper swans travelling further south, there are no defined links with SPAs due to the larger distances to other SPAs and the fact that numerous non-SPA wintering populations are dispersed throughout the country. It is also noted that a population of wintering whooper swan is associated with the River Boyne and River Blackwater SAC (NPWS, 2014).

Wintering golden plover are present in the area in which the Proposed Development is located. It is possible that some of the activity observed includes migratory movement; however, surveys confirm the local wintering population is the primary source of golden plover activity in the area. Considering this, and the fact that non-SPA wintering populations are present in the region (e.g. 3,700 golden plover recorded at Boora Lakes - Back Lakes Finnermore I-WeBS site in winter 2015-16; 3,500 and 3,000 recorded respectively at the Curragh I-WeBS site during winter 2015-16 and winter 2016-17; 350 recorded in winter 2016-17 at Lullybeg I-WeBS site) there are no defined links between any potential migratory activity traversing the Proposed Development and SPAs,

including the closest SPAs which include golden plover as an SCI (Middle Shannon Callows SPA - 49 km W, Lough Ree SPA - 50 km NW and Lough Iron SPA – 34 km NW).

The local lapwing population observed during surveys includes both wintering birds and a smaller number of resident birds/summer visitors. Surveys did not identify any patterns indicating the Proposed Development is traversed by groups of migrating birds. Similarly to golden plover, non-SPA wintering populations are also present in the region (e.g. 1,570 lapwing recorded at Boora Lakes - Back Lakes Finnermore I-WeBS site in winter 2015-16; mean winter count of 65 lapwing at Lough Ennell I-WeBS site; 200 lapwing recorded at HVP17 Derryarkin in January 2025). As such, due to the presence of dispersed lapwing populations in the wider region and no records of migratory behaviour during surveys, there are no defined links between any potential migratory activity traversing the Proposed Development and SPAs, including the closest SPAs which include lapwing as an SCI (Middle Shannon Callows SPA - 49 km W and Lough Ree SPA - 50 km NW).

The small number of observations (six in total), activity observed (foraging/commuting) and timing (mid-summer and mid-winter) of black-headed gull observations does not indicate any migratory activity patterns. Observations of lesser black-backed gull were higher during the breeding season, which aligns with a known larger population of summer visitors and smaller population of winter visitors. While there is potential for some of the lesser black-backed gull observations to be indicative of migratory movements, there are no defined links between any potential migratory activity traversing the Proposed Development and SPAs due to the presence of dispersed non-SPA populations and lack of SPAs in proximity to the Proposed Development (closest SPA which includes this species as an SCI is Poulaphouca Reservoir SPA located 43 km SE).

Due to the very limited number of greylag goose observations and low number recorded (just one record of a single across all surveys, recorded in November 2023), there is no evidence of habitual migration through the Proposed Development. In addition, a resident feral population is present, meaning that not all birds observed will migrate. Mallard were observed during both the winter and summer seasons, sometimes with larger flocks of between 22 to 68 birds seen in flight. Mallard is a resident species and also a winter visitor; as such, none of the summer-season observations have potential to be indicative of migration. Observations of mallard flight activity during autumn 2022 and spring 2024 and total of eight observations ranging from one to 23 birds are potentially indicative of migratory movement. Due to the presence of dispersed mallard populations in the wider region and absence of SPAs in close proximity, there are no defined links between any potential migratory activity traversing the Proposed Development and SPAs, including the closest SPA which includes mallard as an SCI (Lough Ree SPA located 50 km NW).

Considering the absence of SPAs with migratory SCIs in proximity to the Proposed Development, in addition to the dispersed locations of these SPAs relative to the Proposed Development, there is no indication of definitive links between migratory species occurring at the Proposed Development and specific SPAs listed in **Table 4**. Any potential migratory movements cannot be associated with specific SPAs, and any migratory movements occurring in and around the Proposed Development may be linked to wintering populations at non-designated sites.

Table 4. SCI Migratory Species and SPAs in Wider Region

SPA	Distance	Whooper Swan	Golden Plover	Lapwing	Black-headed Gull	Mallard	Greylag Goose	Lesser Black-backed Gull
Middle Shannon Callows SPA	49 km	✓	✓	✓	✓	-	-	-
Lough Ree SPA	50 km	✓	✓	✓	-	✓	-	-
Lough Iron SPA	34 km	✓	✓	-	-	-	-	-

SPA	Distance	Whooper Swan	Golden Plover	Lapwing	Black-headed Gull	Mallard	Greylag Goose	Lesser Black-backed Gull
Lough Derravarragh SPA	32 km	✓	-	-	-	-	-	-
Poulaphouca Reservoir SPA	43 km	-	-	-	-	-	✓	✓

4.2.4 Characteristics of the Project

4.2.4.1 Embedded Design

The Proposed Development incorporates a suite of embedded controls that are integral to the design, layout, and construction methodology. These controls are not mitigation measures introduced to avoid or reduce adverse effects, but rather inherent components of the Proposed Development. As such, they are considered part of the baseline for assessment under Article 6(3) of the Habitats Directive.

The turbine layout has been carefully designed to avoid sensitive ecological features, including Annex I habitats, watercourses, and riparian zones. The layout also minimises loss of habitat, avoids fragmentation of habitats and maintains natural drainage patterns. Turbines, access tracks, and associated infrastructure have been sited to ensure adequate buffer distances from mapped watercourses and ecologically sensitive areas, based on detailed ecological and hydrological surveys.

The drainage design is a key embedded control and has been developed to replicate natural hydrological regimes in accordance with Sustainable Drainage Systems (SuDS). The system includes upslope clean water drains and downslope dirty water drains, with track surfaces graded to direct runoff appropriately. Dirty water drains discharge to settlement ponds for attenuation and sediment capture, while clean water is piped beneath tracks to maintain pre-existing flow paths. These features are designed to prevent sediment mobilisation, protect water quality, and avoid hydrological alteration of downstream catchments.

Water course crossings have been designed in accordance with best practice guidance to minimise hydrological disruption. The design prioritises the use of clear-span pre-cast concrete culverts and bottomless culverts to avoid instream works where possible and maintain the natural channel profile, gradient, and ecological continuity of the watercourses. No works will occur within 20 metres of EPA-mapped watercourses, except at designated and pre-assessed crossing points. This 20m hydrological buffer is a core embedded control and is consistently applied across the site layout, drainage design and construction methodology.

Best practice guidance will be followed at all times during the construction, operation, and decommissioning phases of the Proposed Development. The Proposed Development will adhere to standard guidance including the Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA, 2008a) and Planning for Watercourses in the Urban Environment (Inland Fisheries Ireland, 2020) and relevant CIRIA guidance.

4.2.4.2 Construction Phase

The construction phase of the Ballinla Wind Farm involves the development of seven wind turbines with a blade tip height of 185m, a 110kV substation, and associated infrastructure across a 42-hectare site in County Offaly. The works will be executed in a phased manner over approximately 18 months, commencing in 2027, subject to planning and permitting.

There is no spatial overlap with any Natura 2000 site; therefore, there will be no land-take within any Natura 2000 site. The construction works for the Proposed Development will be carried out in a phased manner in order to minimise disruption to the local community, minimise environmental impact and ensure the safest working conditions possible.

The construction of the Proposed Development will principally comprise of the following works:

- Site Preparation: Includes tree felling (approx. 21ha), establishment of site entrances, and construction of a temporary compound with welfare facilities.
- Access Infrastructure: Construction and upgrading of internal access tracks using excavated or floating techniques, with watercourse crossings implemented via culverts or clear-span bridges.
- Turbine Foundations and Hardstands: Excavation and installation of reinforced concrete foundations and crane hardstands for each turbine.
- Electrical Works: Installation of underground cabling connecting turbines to the substation and onward to the grid via an 8km underground cable (assessed but subject to separate planning).
- Substation Construction: Includes two buildings (EirGrid and IPP) with associated fencing, drainage, and water harvesting systems.
- Spoil Management: Excavated material (~84,700m³) will be reused or deposited in a designated spoil area with engineered containment.
- Surface Water Management: Implementation of a drainage system with clean and dirty water separation, settlement ponds, and interceptor channels to protect water quality.
- Traffic and Delivery: Turbine components will be delivered via designated routes with temporary road modifications.
- Landscaping and biodiversity enhancement.

4.2.4.2.1 Construction Working Hours & Personnel

Typically, construction will occur within the hours 7.00am – 7.00pm, Monday to Friday and 7.00am to 4.00pm on Saturdays, which will be confirmed with the Local Authority. There shall be no work on Sunday or bank holidays unless preapproved with the Local Authority.

Overall, it is envisaged that the Proposed Development would generate employment for up to 60 persons during the construction phase to include site contractors, onsite vehicle and plant operators, engineers, materials delivery personnel, environmental, and health and safety personnel.

It is expected that the civil works for the grid connection route will require at least 10 personnel to complete the works. The electrical works will require less heavy machinery but more labour personnel, with typically 25 personnel to complete the works.

4.2.4.2.2 Forestry Clearance and Site Preparation

Prior to construction, approximately 21ha of commercial forestry will be felled to facilitate turbine foundations, access tracks, hardstands, and spoil deposition areas. This clearance will be conducted under a felling licence in accordance with national forestry standards and environmental guidelines. The cleared areas will be surveyed and prepared for construction, including vegetation removal, topsoil stripping, and initial drainage works. Replanting will occur offsite under a separate afforestation licence, ensuring no cumulative impact within the development boundary.

4.2.4.2.3 Site Access and Compound Establishment

Two permanent site entrances will be constructed off the L5010 local road to serve the northern and southern portions of the site. A temporary construction compound of approximately 4,750m² will be established adjacent

to the proposed substation. This compound will house welfare facilities, offices, storage areas, and wastewater holding tanks. It will be securely fenced and include bunded areas for fuel and chemical storage. Upon completion of construction, the compound will be decommissioned and landscaped.

Temporary features on site will include the compound facilities, plant, and equipment along with safety fencing and building materials. Other main temporary features include the temporary blade set down and temporary crane areas at the turbine locations. Large excavators and turbine erection cranes will also be a temporary feature on site during the construction phase. There will be some temporary stockpiling of soils on site. Any surplus material will be placed within designated deposition areas.

4.2.4.2.4 Internal Access Tracks

New internal access tracks will be constructed and existing tracks upgraded to connect all turbines and infrastructure. Depending on ground conditions, tracks will be built using either excavated or floating techniques, incorporating geotextile layers and aggregate.

4.2.4.2.5 Surface Water Management

A surface water management system will be installed along all tracks, with clean and dirty water separation, settlement ponds, and interceptor channels to prevent erosion and protect downstream water quality. Key drainage measures include:

- Separation of clean and dirty water flows along internal access tracks, with upslope clean water drains and downslope dirty water drains.
- Dirty water will be directed to settlement ponds before being discharged overland.
- Clean water will be piped beneath tracks to maintain natural flow paths and avoid hydrological disruption.
- No construction will occur within 20m of EPA-mapped watercourses, except for essential crossings and minor works.

4.2.4.2.6 Proposed Wind Farm Watercourse Crossings

The Proposed Development requires multiple watercourse crossings, including four crossings of EPA-registered streams within the Proposed Wind Farm. These will be implemented using one clear-span bridge and three culverts. Additionally, nine field drains in the northern section and four forestry drains in the southern section will be crossed using bottomless and box culverts respectively.

4.2.4.2.7 Hardstand and Foundation Construction

Each turbine will be served by a hardstand area approximately 80m x 30m, constructed to support delivery and erection activities. Foundations will be excavated or piled using rotary core techniques, followed by installation of reinforced concrete bases. These areas will be graded to ensure proper drainage and will remain in place post-decommissioning, covered and allowed to revegetate naturally to minimise environmental disturbance.

4.2.4.2.8 Turbine Delivery

Turbine components for the Proposed Development will be imported via one of Ireland's deepwater ports, such as Belview Port in County Waterford. From the port, components will be transported along the national road and motorway network to Junction 5 (Kilbeggan/Tullamore) on the M6, before continuing south on the N52 toward Tullamore (see **Figure 7**). Due to constraints in road geometry, including vertical and horizontal alignment limitations, turbine blades and tower sections will follow separate delivery routes from the N52/L2025 roundabout near Tullamore to Ballinagar village.

To facilitate safe and efficient delivery of turbine components to the Proposed Development, temporary modifications will be made on section of the public road network along the haul routes, including hedge or tree cutting/trimming, relocation of utility poles/powerlines/lamp posts, signage adjustments, and temporary localised road widening at key pinch points. All delivery activities will be managed under a comprehensive TMP and will require abnormal load permits issued by An Garda Síochána.

Such works will be temporary for the delivery of turbine components. There are three locations where temporary TDR node works will be required along the roadside verges and within private lands to facilitate turbine component delivery, and these are included in the planning application boundary. Hedge/tree cutting and local road widening are assessed where applicable.

These TDR node works (See Figure 7) within the red line planning boundary are in the townlands of Ballyfore Big, Ballyleaken and Ballina (Geashill By). These works will involve localised hedgerow removal (40m), topsoil stripping, and the placement of compacted gravel to create widened turning areas. All works are temporary in nature and will be fully reinstated upon completion of construction.

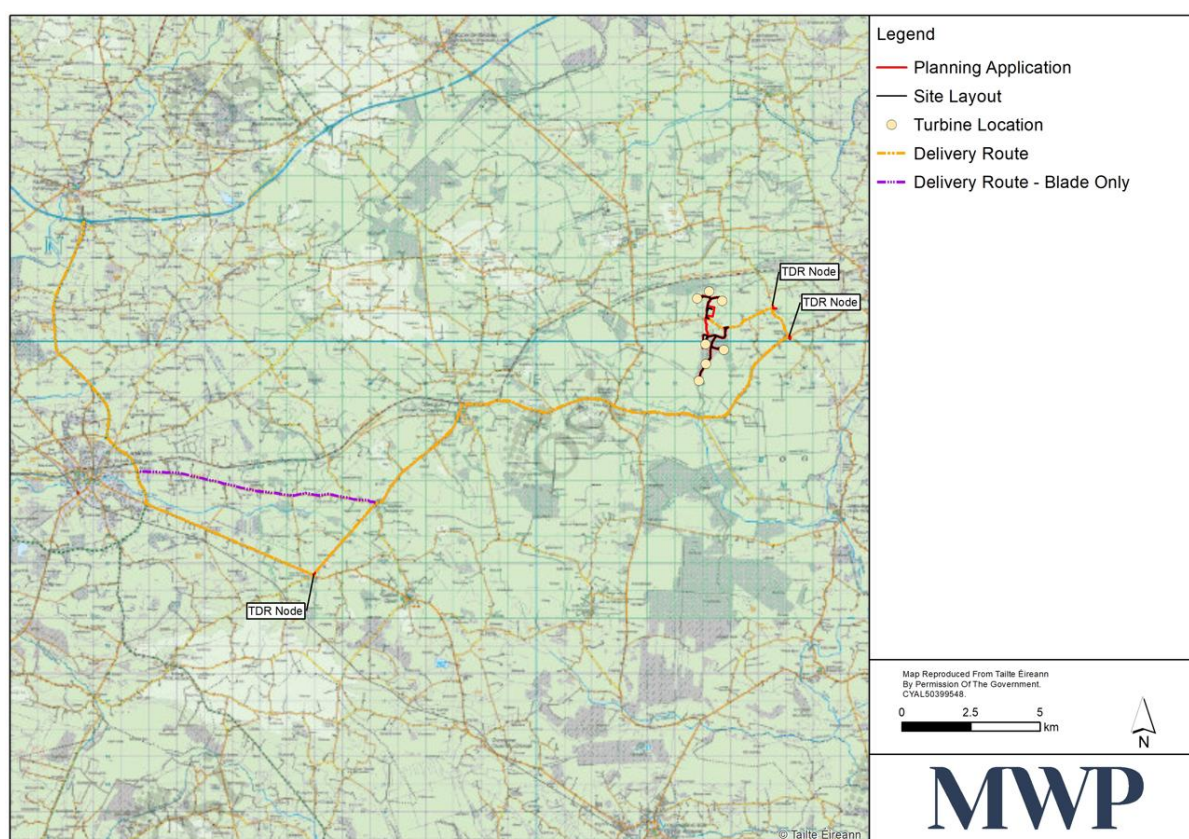


Figure 7. Proposed TDR to Ballinla Wind Farm along the M6

4.2.4.2.9 Turbine Erection

Designated crane pads and temporary blade set-down areas will be established at each turbine location to support assembly operations. Large mobile cranes will be used to manoeuvre all turbine components, including tower sections, nacelles, hubs, and blades, which will be delivered and temporarily stored at designated set-down areas adjacent to each hardstand.

The erection process will begin with the assembly of the tower sections, followed by installation of the nacelle and hub, and finally the blades. Each lift will be carefully coordinated to account for wind conditions and component alignment.

Following turbine erection, commissioning will involve SCADA system integration, electrical testing, and performance verification.

4.2.4.2.10 Electrical Infrastructure Installation

Underground electrical cabling will be installed to connect turbines to the onsite substation. Cables will be laid along access tracks to minimise disturbance, with trenching and ducting used for installation. A fibre optic communication network will be co-located in the same trenches.

The substation compound will include two buildings, one for EirGrid and one for the wind farm operator, alongside an outdoor electrical yard. These buildings will be constructed with rainwater harvesting systems and wastewater holding tanks. The compound will be enclosed by a 2.6m high palisade fence and landscaped upon completion. Adjacent to the substation, an operations compound will house storage containers and waste management facilities.

4.2.4.2.11 Spoil Management

Approximately 84,700m³ of excavated material will be generated, primarily peat and subsoil. Reusable material will be employed for landscaping and bunding, while surplus will be deposited in a designated spoil area at T4, engineered to prevent slippage.

4.2.4.2.12 Landscaping

Upon completion of the main construction activities, a programme of landscaping and final reinstatement works will be undertaken to restore and enhance the visual and ecological character of the site. Temporary construction areas, including crane hardstands, blade set-down zones, and the construction compound, will be reinstated using stockpiled topsoil and subsoil, followed by natural revegetation or seeding with appropriate native species.

Cut and fill slopes around infrastructure such as the substation compound and access tracks will be topsoiled and vegetated to blend with the surrounding landscape. Permanent site entrances will be scaled back and softened with planting and fencing to reduce visual impact and integrate with the local environment.

Settlement ponds constructed as part of the surface water management system will remain in place and contribute to long-term biodiversity, providing habitat for aquatic and semi-aquatic species. Landscaping will also include the installation of fencing, gates, and signage where required for safety and operational access.

4.2.4.2.13 Material Use

Large amounts of aggregates, concrete, and steel will be used during construction as summarised in **Table 5**. All of the aggregate materials (rock, stone, gravel, sand) required for the construction of the tracks, hardstands and the substation compound will be delivered to the site from local quarries.

Table 5. Summary of Approximate Aggregate and Steel Quantities

Item	Unit	Quantity
Imported stone for turbine bases	m3	10,738
Imported stone for turbine hardstand	m3	28,816
Imported stone for access tracks	m3	4,654
Imported stone for substation area	m3	16,843
Imported stone for temporary compound	m3	3,781

Item	Unit	Quantity
Imported stone for independent power producer	m3	19,899
Imported stone for external cable route	m3	2,943
Imported stone for internal cable route	m3	121
Total volume of imported aggregate required	m3	87,795
Concrete for turbine Bases	m3	8,482
Concrete for substation	m3	73
Concrete for lidar unit	m3	3
Concrete for independent power producer	m3	327
Concrete for external cable route	m3	2,864
Concrete for internal cable route	m3	1,852
Total volume concrete required	m3	13,601
Reinforced steel for turbine bases	tonnes	1,272
Reinforced steel for substation	tonnes	9
Reinforced steel for IPP	tonnes	41
Reinforced steel for lidar unit	tonnes	0
Total volume of imported steel reinforcement required	tonnes	1,323

4.2.4.2.14 Construction Waste Management

Waste management during the construction phase of the Proposed Development will be governed by best practice procedures and regulatory compliance to minimise environmental impact. A range of waste types will be generated, including excavated soils, construction materials, domestic waste, and wastewater from welfare facilities.

Construction activities will generate waste such as hardcore, concrete, steel reinforcement offcuts, timber shuttering, unused oils, and packaging materials. These will be stored securely within the construction compound and removed at regular intervals by authorised contractors. Recyclable materials, including plastics and metals, will be segregated and sent to approved recycling facilities. All waste will be handled in accordance with the Waste Management (Hazardous Waste) Regulations 1998 and disposed of at licensed facilities.

Wastewater from welfare facilities will be collected in integrated holding tanks associated with mobile toilet units. During peak construction, wastewater generation is estimated at approximately 3,000 litres per day. The tanks will be emptied regularly by permitted waste contractors and transported to licensed treatment facilities. No untreated effluent will be discharged to the environment.

4.2.4.2.15 Proposed Grid Connection

Although subject to a separate planning application, the Proposed Grid Connection to the national electricity grid has been assessed as part of this AA screening to ensure a comprehensive understanding of potential cumulative impacts. The connection comprises a 110kV underground cable extending approximately 8km from the proposed 110kV substation to the newly constructed Philipstown 110kV substation.

The route follows internal access tracks for approximately 0.5km before entering the public road network at the L-5010. From there, the cable runs east for 2km to the L-5006, then south for 5km along the L-5006, and finally 1km along the R401 to the grid connection point. The alignment primarily follows existing road corridors, minimising land take and environmental disturbance.

The cabling will be installed using open-cut trenching within the road carriageway or roadside verge, depending on site-specific constraints. Typical trench dimensions will be approximately 1.2m wide and 1.2m deep, with cable ducts laid in a sand or fine gravel bed and backfilled with suitable material. Where required, temporary traffic management measures will be implemented to ensure safety and minimise disruption.

Joint bays will be installed at regular intervals (typically every 500m to 1,000m) to facilitate cable splicing. These will involve localised excavation of larger pits, typically 3m x 2m in size, and will be reinstated upon completion. Additional infrastructure such as link boxes and marker posts will be installed at accessible locations for maintenance purposes.

The Proposed Grid Connection includes approximately 18 watercourse crossings, comprising one EPA-mapped stream and multiple agricultural land drains. Crossing methodologies for land drains will be selected based on site-specific hydrological and ecological sensitivities and may include open-cut trenching during dry periods, installation through existing culverts. HDD will be adopted at the EPA registered water crossing to avoid direct disturbance. HDD is also proposed for the identified Bord na Móna rail crossings near Edenderry Power Station.

All disturbed areas, including verges and hedgerows, will be reinstated following construction in accordance with best practice and landowner agreements.

4.2.4.3 Operational Phase

The Proposed Development is expected to have a lifespan of circa 35 years. The Proposed Development is designed to operate when wind speeds at the hub height are within the operating range of the wind turbines. Most turbine models have a cut in wind speed of 3m/s with optimum generation at approximately 12.5m/s. The turbines are expected to have a cut out wind speed of 25m/s.

Surface water will be managed in accordance with the principles and objectives of SuDS (Sustainable Drainage Systems) to treat and attenuate water prior to discharging offsite. The site surface water management system constructed during the construction phase of the Proposed Development will be implemented and maintained for the operational phase of the Proposed Development.

During the operational phase, maintenance personnel will visit the substation building on a regular basis. The daily average wastewater production during the operational phase is estimated from the average number of workers on site, which is expected to be 2 workers, resulting in a typical wastewater production rate of 100 litres per day on days where substation maintenance and monitoring is undertaken. The wastewater generated during the operational phase will be managed by a holding tank which is of twin-hull design and fitted with an alarm to indicate levels and when it requires emptying. The holding tank will be emptied by a permitted contractor and treated at a licenced facility.

Potable water for the operational and maintenance phase is estimated to be approximately 50 litres per day. This water will be supplied as bottled water. Waste water facilities at the substation compound will be serviced by a rainwater harvesting system.

The general operation and maintenance of the Proposed Development is expected to produce a minimal amount of waste. Wastes arising during the operation phase of the Proposed Development include but are not limited to lubricating oils, cooling oils, and packaging from spare parts. The containment and off-site disposal of such oils will be carried out by an approved contractor. Such operations will be carried out in accordance with the Waste

Management (Hazardous Waste) Regulations, 1998. The remaining wastes will all be removed from site and reused, recycled, or disposed of in an authorised facility in accordance with best practice.

Site layout figures showing the extent of works are included in **Appendix 2**.

4.3 Identification of Other Projects or Plans or Activities

The obligation to undertake Appropriate Assessment under the 2011 Birds and Natural Habitats Regulations derives from Article 6(3) and 6(4) of the Habitats Directive. Regulation 42 (1) of the 2011 Regulations requires that:

A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.

It is therefore required that the potential impacts of the proposed works be considered in combination with other relevant plans or projects.

To inform the assessment of potential in-combination effects, a review of the Offaly County Development Plan 2021-2027 as well as consent applications for projects in the vicinity of the proposed works included on the following websites was completed in July 2025:

- Department of Housing, Planning and Local Government (DHPLG) – Environmental Impact Assessment (EIA) Portal
- <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/services/eia-portal/>
- National Planning Application Map Viewer
- <https://www.myplan.ie/national-planning-application-map-viewer/>
- Offaly County Council – Planning System
- <https://www.offaly.ie/planning-search/>
- Offaly County Council – Planning Register ArcGIS Application
- <https://arc-gis-hub-home-arcgishub.hub.arcgis.com/documents/donegal::offaly-county-council-web-mapping-portal/explore>
- An Bord Pleanála – Strategic Infrastructure Development (SID) Portal
<https://www.pleanala.ie/en-ie/strategic-infrastructure-development-guide>

4.3.1 Plans

With regards to the potential for in-combination effects, the Offaly Biodiversity Action Plan 2025–2030¹⁰ and the Offaly County Development Plan 2021–2027, and accompanying mapping were considered.

The Offaly Biodiversity Action Plan 2025–2030 outlines a strategic framework for conserving and enhancing biodiversity within the county. It emphasises the protection of designated sites, including Natura 2000 sites, and highlights the importance of sustainable land-use practices. The plan identifies key threats to biodiversity, such as nutrient pollution from agricultural runoff, pesticide use, light pollution, and the spread of invasive species.

¹⁰ <https://www.offaly.ie/app/uploads/Offaly-Biodiversity-action-Plan-2025-2030.pdf>

In the context of the Proposed Development, it is essential to consider these frameworks to ensure that the development does not adversely affect protected areas or contribute to the identified threats to biodiversity. Implementing industry best practise measures and engaging in habitat enhancement efforts can help align the project with both local and national biodiversity objectives.

The Offaly County Development Plan 2021–2027 outlines the county’s strategic vision for sustainable development, with strong emphasis on protecting biodiversity, Natura 2000 sites, and the wider natural environment. The plan supports renewable energy, including wind energy, provided developments are sited and designed to avoid adverse impacts on designated conservation sites, ecological corridors, water quality, and sensitive landscapes. The County Wind Energy Strategy, forming part of the plan, requires proposals to undergo Appropriate Assessment and ensure no significant effects on Natura 2000 sites. The plan also promotes integrated water resource management and adherence to the Water Framework Directive to protect aquatic ecosystems. Additionally, it identifies the importance of maintaining green infrastructure, preventing habitat fragmentation, and implementing climate action measures, all of which should be considered in assessing cumulative effects of wind farm developments such as the one proposed in Ballinla.

4.3.2 Permitted and Proposed Developments in the Locality

A review of granted or ongoing planning applications for areas in proximity to the proposed works area was undertaken using the Offaly County Council’s online ePlan search tool¹¹ (accessed August 2025). **Table 6** lists the main developments within the area.

Table 6. Granted and Ongoing Planning Applications in the Locality

Planning Ref.	Applicant	Description		Planning Authority Decision
PL2/19/606 306924 (ABP)	Cloncant Renewable Energy Ltd.	The development will consist of up to 8 wind turbines with a tip height of up to 187m and all associated development including foundations, hardstands, access roads, cabling, substation, battery storage facility and grid connection, on an area of 60.674 ha.	Ballykilleen, Co. Offaly	Granted, Conditional (ABP) 25/09/2020
309686 (ABP)	Cloncant Renewable Energy Ltd.	The Proposed Development is a 110kV substation with a 400m 110kV overhead line grid connection. It includes one site entrance off the R401, a temporary construction site compound and all associated site development	Ballykilleen, Co. Offaly	Granted, Conditional (ABP) 11/04/2022
21290 (LA)	Bord Na Mona Energy Ltd	Intended to extend the lifetime of Clonbullogue ash repository to the end of 2031. The development will consist of: (1) The continued operation of the existing ash repository from the beginning of 2024 until the end of 2031, including all the associated infrastructure. (2) the deposition of up to 13,000 tonnes per annum of biomass ash from Edenderry power plant between the beginning of 2024 until the end of 2030. (3) An amendment to the planning boundary to incorporate the existing site entrance. (4) the completion of the construction of cell 6 (up to an area of 23,752m2) (5)	Cloncreen, Clonbullogue, Co. Offaly	Granted, Conditional 14/04/2022

¹¹ <https://www.eplanning.ie/OffalyCC/searchexact>

Planning Ref.	Applicant	Description	Planning Authority	Decision
		The completion of the capping of cells 5 over an area of 24,009m ² and cell 6 over an area of 23,752m ² and (6) the sourcing of capping material for cells 5 and cell 6 from 2 no. areas, area No. 1 and area No. 2 within the site boundary. Area no. 1 covers an area of up to approximately 35,000m ² and area no. 2 covers an area up to 15,000m ² . Clonbullogue Ash Repository is licenced by the environmental protection agency under an Industrial Emissions (IE) Licence (ref: W0049-02). Activities at the facility and associated environmental aspects and emissions will continue to be regulated and controlled by the EPA.		
21190 (LA)	Mark Rochford	Construction of A-roof (agricultural buildings) to include a milking parlour, calf rearing pen, feed storage, cow collecting sheds, silage pit, slurry lagoon and associated site works	Ballinla Farm, Co. Offaly	Granted, Conditional 09/07/2021
2560200	Mark Rochford	Construction of an A-Roof shed (agricultural building), permission to construct a soiled water/slurry lagoon and associated site works. (This application is within the curtilage of a protected structure Ref 16-15 Ballinla House)	Ballinla Farm, Co. Offaly	Submitted 25/05/2025
19496 (LA)	Bord Na Mona PLC	Alterations to the existing 110kV Cushaling substation and includes the installation of 110kV ais switchgear with associated foundations, steelwork, supports and connectors and associated works	Ballykilleen, Edenderry, Co. Offaly	Granted, Conditional 17/12/2019
19500 (LA)	Bord Na Mona PLC	The erection and operation of a multi-user telecommunications mast to be utilised as part of the national broadband plan, comprising a 45-metre lattice structure, 6no cabinets on structure plinths, fibre chamber, antennae, turning area, compound, fencing, gate, access and all associated works and services	Ballykilleen, Co. Offaly	Granted, Conditional 18/12/2019
2152 (LA)	Bord Na Mona Powergen Ltd	A modular battery energy storage system (BESS) facility within the footprint of a previously consented construction compound (ABP ref PL19.PA0047) Planning permission sought for a period of 10 years. The facility will consist of up to 28 No, battery storage modules (up to 13m in length, 3m in width and 3m in height) and ancillary equipment.	Ballykilleen, Co. Offaly	Granted, Conditional 30/07/2021
22494 (LA)	Cloncant Renewable Energy Limited	The development of (a) approximately 970m of new internal access roads for the permitted Cushaling Wind Farm (planning ref PL2/19/606 ABP 306924) (B) Upgrade of approximately 560m of an existing Bord Na Mona bog access road (c) construction of a double circuit 33kV underground collector cable from the permitted Cushaling Wind Farm to the permitted wind farm substation (d) demolition and replacement of a Bord Na Mona bogland access bridge and (e) relocation of the	Ballykilleen, Co. Offaly	Granted, Conditional 28/03/2023

Planning Ref.	Applicant	Description		Planning Authority Decision
		permitted Cushaling Wind Farm substation 25 meters southwest		
PA0047	Bord Na Mona Powergen	Proposed Cloncreen Wind Farm comprising up to 21 no. wind turbines and all associated works	Cloncreen, Co. Offaly	Granted, Conditional 03/05/2017
314660	Figile Ltd	Planning application for small quarry, with necessary facilities and upgrade of entrance	Mount Lucas, Tullamore, Co, Offaly	Not decided – No EIAR/NIS
304925	Highfield Solar Ltd	Solar PV energy development within a site area of approximately 15ha	Rhode, Co. Offaly	Granted, Conditional 11/03/2021
309491	OBM Solar Ltd	110kV Substation, associated 110kV underground grid connection, cabling and associated works	Rhode, Co. Offaly	Granted, Conditional 13/10/2021
315436	Bord Na Mona	Application for leave to apply for substitute consent for peat extraction and all associated bog development works	Co. Offaly	Not decided – No EIAR/NIS
306236	Bord Na Mona	Leave to apply for substitute for peat extraction	Co. Offaly	Granted, Conditional 01/05/2020
319023	Bord na Móna Powergen Ltd	Combined Cycle Gas Turbine and Open Cycle Gas Turbine Thermal Power Plant, Electricity Grid Connection including 2 no. substations, and associated buildings, plant, site works, service and ancillary development	Rhode, Co. Offaly	Lodged 09/02/2024 Live case
2379	Jason McNamee	Construction of a two-storey dwelling house, a detached garage, vehicular entrance, installation of a septic tank/percolation area and any other associated site works	Leitrim, Edenderry, Co. Offaly	Granted, 28/02/2023
2460289	Rohde LDES Limited	Development of a 22-hectare site. The Proposed Development comprises (i) two (2no.) air dome structures for the storage of carbon dioxide at atmospheric pressure (each 500m x 120m x 34m high) and associated cooling, compression, pumping and power generation equipment and machinery (ii) a single-storey storage and control building, (iii) internal site access roads and connection to existing and consented roads at Rhode Green Energy Park, (iv) underground electrical cable connection to Derryiron 110kV substation, (v) all civil engineering works, surface water and foul water drainage, landscaping, lighting and security fencing	in the townlands of Clonin, & Coolcor, Rhode Co. Offaly	Lodged 28/07/2024 Live case
16246	Highfield Solar Limited	A period of 10 years to complete the development of a solar PV energy development with a total site area of circa 96.6 hectares, to include one single storey electrical substation building and associated compound, electrical transformer and inverter station modules,	Clonin, Rhode, Co. Offaly	Granted 07/03/2017

Planning Ref.	Applicant	Description	Planning Authority Decision
		storage modules, solar PV panels ground mounted on support structures, access roads, fencing and associated electrical cabling, ducting, CCTV and other ancillary infrastructure, additional landscaping as required and associated site development works	
2560115	Bord Na Mona	The development of a recreational shared cycle and walkway located on Bord Na Móna lands. The development proposes the following: a) The delivery of a shared cycle and walkway on Bord na Móna lands. This will include the repurposing of 18,958 meters of existing former rail bed and 827 meters along pre-existing machine access routes. b) The proposed shared cycle and walkway will connect into the existing Grand Canal Way within the townlands of Coole and Knockballyboy; the Public Amenity Facilities at Mountlucas Wind Farm within the townlands of Clonarrow or Riverlyons and Drumcaw or Mountlucas; and the Cloncreen Wind Farm Amenity Track within the townland of Clongarret. c) The construction of car and / or bicycle parking facilities at a number of gateway locations along the proposed route and the provision of EV Charging spaces at the Gateway locations.	Bord Na Móna lands within County Offaly Lodged 08/04/2025 Live case
2560189	Clonarrow Windfarm Limited	For the erection of 4 wind turbines. A 10-year planning permission and 35 year operational life from the date of commissioning of the entire wind farm is being sought. The planning application will be accompanied by an Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS).	Clonarrow or Riverlyons,, and Killoneen,, Co. Offaly. FI requested 17/07/2025
316212	Bord na Móna Powergen LTD.	Proposed development of 26 no. wind turbines and associated works. Ballivor wind farm.	Co. Meath and Co. Westmeath. (21km from proposed Development) Granted 22/11/2024

4.3.3 EPA Licenced Facilities

A review of the EPA mapping tool determined that there are no IPPC, IPC, IEL¹² or wastewater treatment facilities within the immediate vicinity of the subject site. An Industrial Emissions Licenced (IEL) facility, 'Rosderra Farms Unlimited Company' (Licence No: P0681-01) is located at Ballyfore, Edenderry, approximately 2km to the east of the subject site.

4.3.4 Other Wind Farm Developments

The Proposed Development would positively cumulate with other wind farm developments in the region to advance in delivering local, regional, and national Green Energy targets. Wind turbines identified within 25km of the proposed Ballinla development are listed below:

- Cushaling Wind Farm (9 turbine) (existing).
- Cloncreen Wind Farm (21 turbine) (existing).
- Mountlucas Wind Farm (28 turbine) (existing).

¹² Integrated Pollution Control (IPC) Licence (formerly IPPC Licence), and Industrial Emissions Licence (IEL)

- Yellow River Wind Farm (29 turbine) (existing).
- Moanvane Wind Farm (12 turbine) (Permitted and under construction).
- Dernacart Wind Farm, Co. Laois (8 turbine) (Permitted).
- Drehid Wind farm (11 turbine) (Submitted).
- Clonarrow Wind Farm (4 turbine) (Planning lodged)

4.3.5 Existing Land-Use and Ongoing Activities

Existing land cover at the Proposed Wind Farm consists of agricultural land in the northern section and coniferous commercial forest in the southern section. The northern and southern sections of the Proposed Development are split by the L5010 local road which travels in an east west direction bisecting the Proposed Development.

The Proposed TDR and Proposed Grid Connection are predominantly located within existing public road corridors and adjacent agricultural pastures at the identified TDR nodes.

The Grand Canal is located 0.5km north of the Proposed Development. The surrounding land includes agricultural fields, forestry and cutover peatlands.

4.4 Identification of Natura 2000 Sites

4.4.1 Zone of Influence (ZOI)

The ‘*zone of influence*’ (ZOI) for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The ZOI will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

According to Office of the Planning Regulator (OPR) (2021), the zone of influence of a Proposed Development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a Natura 2000 site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km).

The ZOI for the Proposed Development was identified through a review of the nature of the project, known impacts and effects likely to arise as a result of the project, distance from Natura 2000 sites and their qualifying interests and any landscape¹³ or ecological¹⁴ connectivity between the Proposed Development and Natura 2000 sites. **Figure 8** presents all the Natura 2000 sites that are within the vicinity of the proposal.

Similarly, there may be indirect impacts to Natura 2000 sites, via impacts to non-qualifying interest habitats within a Natura 2000 site or such habitats outside a site, or via impacts to species for which a site has been designated beyond the site where this might affect the conservation objectives of the Natura 2000 site. This is particularly relevant in relation to SPAs, where areas outside the Natura 2000 site are often important for bird species.

¹³ Landscape connectivity is a combined product of structural and functional connectivity, i.e. the effect of physical landscape structure and the actual species use of the landscape (Kettunen *et al.* 2007)

¹⁴ Connectivity is defined as a measure of the functional availability of the habitats needed for a particular species to move through a given area. Examples include the flight lines used by bats to travel between roosts and foraging areas or the corridors of appropriate habitat needed by some slow colonising species if they are to spread (CIEEM, 2018).

Following identification of Natura 2000 sites, the potential likely effects associated with the proposal are identified before an assessment is made of the likely significance of these effects. As described above in **Section 4**, the test for the screening for AA is to assess, in view of best scientific knowledge, if the Proposed Development, either individually or in combination with other plans/projects, is likely to have a significant effect on a Natura 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to AA and submit an NIS. **Table 7** presents the Natura 2000 sites that are within the potential ZOI of the Proposed Development.

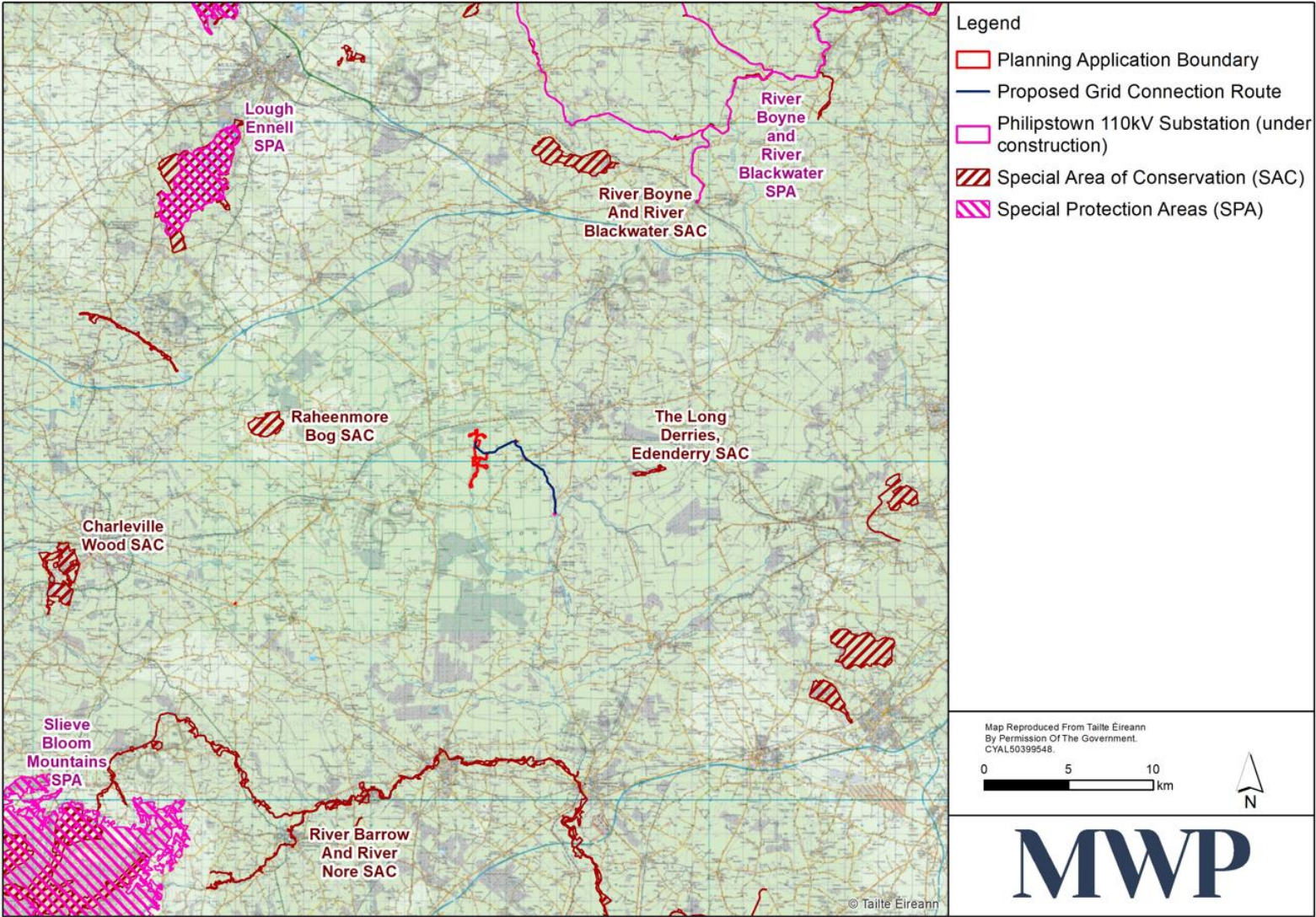


Figure 8. Natura 2000 within the Vicinity of the Proposed Development

Table 7. Natura 2000 Sites Located within the Potential ZOI of the Proposed Development

Designated Site	Site Code	Proximity of Designated Site to Nearest Point of Subject Site	Hydrological/Ecological Connection? (Yes/No)
The Long Derries, Edenderry SAC	000925	7.6km west of the subject site	No
Raheenmore Bog SAC	000582	9.8km west of the subject site	No
River Boyne and River Blackwater SAC	002299	17km north of the site	Yes
River Boyne and River Blackwater SPA	004232	17km north of the site	Yes
River Barrow and River Nore SAC	002162	11.2km south of the site	Yes
Lough Ennell SPA	004044	19.8km northwest of site	No
Slieve Bloom Mountains SPA	004160	25.3km southwest of site	No
Charleville Wood SAC	000571	9.5km west of Ballina (Geashill By) TDR node	Yes

4.4.2 Characteristics of Natura 2000 Sites

Table 8 lists the qualifying features of conservation interest for the Natura 2000 sites identified in **Table 7**. Information pertaining to the Natura 2000 sites is from site synopses, conservation objectives and other information available on www.npws.ie.

Table 8. Qualifying Features of Conservation Interest of Identified Designated Sites

Natura 2000 Site	Qualifying features of Special Conservation Interest
The Long Derries, Edenderry SAC (Site code: 000825)	<ul style="list-style-type: none"> Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]
Raheenmore Bog SAC (Site code: 000582)	<ul style="list-style-type: none"> Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]
River Boyne and River Blackwater SAC (Site code: 002299)	<ul style="list-style-type: none"> Alkaline fens [7230] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] Site synopsis (NPWS, 2014) notes presence of wintering whooper swans.
River Boyne and River Blackwater SPA (004232)	<ul style="list-style-type: none"> Kingfisher (<i>Alcedo atthis</i>) [A229]

Natura 2000 Site	Qualifying features of Special Conservation Interest
River Barrow and River Nore SAC (Site code: 002162)	<ul style="list-style-type: none"> • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Reefs [1170] • <i>Salicornia</i> and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] • European dry heaths [4030] • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] • Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220] • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016] • <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] • <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] • <i>Petromyzon marinus</i> (Sea Lamprey) [1095] • <i>Lampetra planeri</i> (Brook Lamprey) [1096] • <i>Lampetra fluviatilis</i> (River Lamprey) [1099] • <i>Alosa fallax fallax</i> (Twaiite Shad) [1103] • <i>Salmo salar</i> (Salmon) [1106] • <i>Lutra lutra</i> (Otter) [1355] • <i>Trichomanes speciosum</i> (Killarney Fern) [1421]
Lough Ennell SPA (Site Code: 004044)	<ul style="list-style-type: none"> • Pochard (<i>Aythya ferina</i>) [A059] • Tufted Duck (<i>Aythya fuligula</i>) [A061] • Coot (<i>Fulica atra</i>) [A125] • Wetland and Waterbirds [A999]
Slieve Bloom Mountains SPA (Site Code: 004160)	<ul style="list-style-type: none"> • Hen Harrier (<i>Circus cyaneus</i>) [A082]
Charleville Wood SAC (Site Code: 000571)	<ul style="list-style-type: none"> • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]

4.4.3 Conservation Objectives

According to the Habitats Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its biogeographic range when:

- Its natural range and the areas it covers within that range are stable or increasing.
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable as defined below.

According to the Habitats Directive, the *conservation status of a species* means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its biogeographical range when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation objectives for each site listed in **Table 8** above are available on <http://www.npws.ie/protectedsites/>. These have been accessed on the 01/03/2025. Management plans are not currently available for any of the designated sites.

Site-specific conservation objectives were available for the following sites:

- NPWS (2021) Conservation Objectives: The Long Derries, Edenderry SAC 000925. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published November 2021.
- NPWS (2015) Conservation Objectives: Raheenmore Bog SAC 000582. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Published November 2015.
- NPWS (2021) Conservation Objectives: River Boyne and River Blackwater SAC 002299. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published December 2021.
- NPWS (2025) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Published June 2025.
- NPWS (2024) Conservation Objectives: Lough Ennell SPA 004044. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published May 2024.
- NPWS (2022) Conservation Objectives: Slieve Bloom Mountains SPA 004160. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published September 2022.
- NPWS (2021) Conservation Objectives: Charleville Wood SAC 000571. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published November 2021.
- NPWS (2024) Conservation Objectives: River Boyne and River Blackwater SPA 004232. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Published July 2024.

4.5 Identification of Potential Impacts

Potential likely direct, indirect or secondary ecological impacts arising from the Proposed Development (either alone or in combination with other plans or projects) are identified in **Table 9** and **Table 10**.

Table 9. Elements of the Proposed Development Likely to Give Rise to Potential Ecological Impacts

Construction Phase
<ul style="list-style-type: none"> ▪ Excavations, clear felling, ground moving, and heavy engineering required to construct windfarm roads & hardstands, sub-station, underground cabling, grid connection, surface water drainage system, buildings & fencing. ▪ Machinery: The presence and sustained use of heavy and light plant machinery on site, albeit at variable rates and numbers, during daylight hours for the duration of the works. ▪ Use of fuels/oils/lubricants, concrete and other such substances considered harmful to the aquatic environment. ▪ Human presence: Sustained increase in human activity, albeit at variable rates and numbers, during daylight hours for the duration of the works. ▪ Increased noise and air emissions associated with construction activity. ▪ Erection of turbines. Introduction of large physical structures in a previously unoccupied/uninterrupted air space. ▪ Storage of excavated spoil. ▪ Permanent deposition of excavated spoil at specific areas on site. ▪ Temporary site compound. ▪ Temporary surface water flow management systems for specific engineering elements at various locations. ▪ Watercourse crossings using a combination of clear-span culverts, bottomless culverts and HDD.
Operational Phase
<ul style="list-style-type: none"> ▪ Operation of wind turbines at 7 locations (rotation of turbine blades). ▪ Operation of substation. ▪ Operational maintenance works. ▪ Human presence (wind farm staff).
Decommissioning Phase
<ul style="list-style-type: none"> ▪ Decommissioning of wind farm infrastructure including excavation and heavy engineering works, ground moving, use of machinery, temporary storage of spoil, temporary site drainage. ▪ Increased human activity, increased noise and air emissions. ▪ Permanent disassembly and removal of wind farm components including turbines. ▪ Permanent disposal and storage of excavated materials. ▪ Temporary site compound.

Table 10. Direct, Indirect or Secondary Impacts with the Potential to Cause Significant Effects

<p><i>Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of:</i></p> <ul style="list-style-type: none"> ▪ <i>Size and scale</i> ▪ <i>Land-take</i> ▪ <i>Distance from Natura 2000 Site or key features of the Site</i> ▪ <i>Resource requirements</i> ▪ <i>Emissions</i> ▪ <i>Excavation requirements</i> ▪ <i>Transportation requirements</i> ▪ <i>Duration of construction, operation etc.</i> ▪ <i>Other.</i> 	<p>Construction Phase</p> <ul style="list-style-type: none"> ▪ There is no spatial overlap between the subject site and any Natura 2000 site; therefore, there will be no landtake and no direct habitat loss/alteration impacts within any Natura 2000 site. ▪ Disturbance of qualifying animal species as a result of increased noise, artificial lighting and/or the increased presence of personnel, plant and machinery during ▪ There will be loss and direct alteration of habitats (comprising mainly mature conifer forestry and agricultural grassland) within the construction footprint and because of spoil deposition. ▪ Potential direct species disturbance/displacement impacts due to construction activity including fugitive noise emissions from machinery, human activity. ▪ Airborne or waterborne pollution of QI or SCI habitats/species, or habitats supporting QI/SCI. ▪ Direct loss of or damage to potentially supporting habitat(s). ▪ Potential for indirect species disturbance/displacement due to in-situ or ex-situ habitat loss/alteration impacts, impairment of water quality and/or impacts on prey availability. ▪ Potential for spread of invasive alien species.
	<p>Operational Phase</p> <ul style="list-style-type: none"> ▪ Risk of bird mortality through collision or interaction with turbine blades or other wind farm infrastructure. ▪ Disturbance of qualifying animal species as a result of increased noise, artificial lighting and/or the increased presence of personnel, plant and machinery during construction. ▪ Potential for species displacement because of ‘barrier effects’ whereby birds are deterred from using normal routes to access breeding, foraging or roosting habitats elsewhere. For example, behavioural responses to the presence of turbines could cause some species to stop using or reduce their use of foraging grounds in proximity to the turbine envelope. ▪ Airborne or waterborne pollution of QI or SCI habitats/species, or habitats supporting QI/SCI. ▪ Potential for indirect species disturbance/displacement due to impacts on prey availability.
	<p>Decommissioning Phase</p> <ul style="list-style-type: none"> ▪ Disturbance of qualifying animal species as a result of increased noise, artificial lighting and/or the increased presence of personnel, plant and machinery during construction. ▪ Airborne or waterborne pollution of QI or SCI habitats/species, or habitats supporting QI/SCI. ▪ Direct loss of or damage to potentially supporting habitat(s) ▪ Potential for indirect species disturbance/displacement due to in-situ or ex-situ habitat loss/alteration impacts, impairment of water quality and/or impacts on prey availability. ▪ Potential for spread of invasive alien species.

4.6 Identification of Relevant European Sites

This section considers the list of sites identified in **Table 7**, together with the potential ecological impacts identified in **Table 10** and determines whether the project is likely to have significant effects on a Natura 2000 site.

The list of Natura 2000 sites within the potential ZOI of the Proposed Development identified in **Table 7** is now refined using the Source-Pathway-Receptor (SPR) model. This model works on the basis that, in order for an impact to occur on a receptor, there must be a risk initiated by having a 'source' (e.g. excavation), and an impact pathway between the source and the receptor (e.g. a waterbody which connects the proposal site to the protected species or habitats). When assessing impact, Natura 2000 sites are only considered relevant where a credible or tangible SPR link exists between the Proposed Development and a protected species or habitat type.

An evaluation based on these factors to determine which Natura 2000 sites are the plausible ecological receptors for potential impacts of the Proposed Development will be conducted in **Sections 4.6.1** and **4.6.2**. The evaluation takes cognisance of the scope, scale, nature and size of the project, its location relative to the Natura 2000 sites listed in **Table 7**, and the degree of connectedness that exists between the project and each Natura 2000 site's potential ecological receptors.

Once the Natura 2000 sites within the ZOI have been identified on the basis of the SPR model (see **Section 4.6.2**), an assessment is made in relation to these sites of the likely significance of the potential effects associated with the proposal (see **Section 4.7**).

4.6.1 Natura 2000 Sites Outside Likely ZOI

With regards to the proposal, it is considered that the works do not include any element that has the potential to significantly affect the Conservation Objectives for which certain Natura 2000 sites are designated. It is considered that these Natura 2000 sites are outside the ZOI of the proposal due to the absence of plausible impact pathways and/or the attenuating effect of the distance intervening. Therefore, it is objectively concluded that significant effects on the Conservation Objectives of these sites are not reasonably foreseeable as a result of the Proposed Development described at **Section 4.2.4**. These sites, which are listed in **Table 11**, along with their distance from the subject site and the rationale for exclusion, will not be considered further in this report.

Table 11. Natura 2000 Sites Excluded from Further Assessment and Rationale for Exclusion

Designated Site	Proximity of Designated Site to Nearest Point of Subject Site	Rationale for Exclusion from Further Assessment
The Long Derries, Edenderry SAC (000925)	7.6km west of the site.	<ul style="list-style-type: none"> Proposed Development boundary is located outside the boundary of SAC and there is no potential for direct effect. Designated for terrestrial habitat - dry grasslands and scrubland facies on calcareous substrates. The Proposed Development is located within a separate WFD River Sub Basin, WFD Subcatchment, WFD Catchment. Therefore, there is no potential for indirect significant effect via surface water pathways. No plausible impact pathway linking the Proposed Development site to the SAC. No pathway for likely significant effect on this Natura 2000 Site was identified and, therefore, the site is not located within the Likely ZOI and is not considered further in this assessment.

Designated Site	Proximity of Designated Site to Nearest Point of Subject Site	Rationale for Exclusion from Further Assessment
Raheenmore Bog SAC (000582)	9.8km west of the site.	<ul style="list-style-type: none"> Proposed Development boundary is located outside the boundary of SAC and there is no potential for direct effect. Designated for three peatland habitats. The Proposed Development is located within a separate WFD River Sub Basin, WFD Subcatchment, WFD Catchment. Therefore, there is no potential for indirect significant effect via surface water pathways. No plausible impact pathway linking the Proposed Development site to the SAC. No pathway for likely significant effect on this Natura 2000 Site was identified, and, therefore, the site is not located within the Likely ZOI and is not considered further in this assessment.
Lough Ennell SPA (004044)	19.8km northwest of site	<ul style="list-style-type: none"> Proposed Development boundary is located outside the boundary of SPA and there is no potential for direct effect. Designated for three species of wintering waterfowl - Pochard, Tufted Duck, Coot - and for the site's Wetland habitat and associated Waterbirds The Proposed Development is located 19.8km northwest of Lough Ennell SPA. As such, it is located outside the core foraging range of the Coot, Tufted Duck and Pochard (SNH, 2016). Additionally, no large waterbodies suitable for waterbird species are present on site. Indirect impacts on the SCI habitat 'Wetlands' can be ruled out due to the absence of hydrological connectivity, the buffering distance of approx. 19.8km between the Proposed Development site and the SPA, and the absence of a complete source-pathway-receptor chain. No plausible impact pathway linking the Proposed Development site to the SPA. No pathway for likely significant effects on this Natura 2000 Site was identified, and, therefore, the site is not located within the Likely ZOI and is not considered further in this assessment.
Slieve Bloom Mountains SPA (004160)	25.3km southwest of site	<ul style="list-style-type: none"> The Proposed Development boundary is located outside the boundary of SPA and there is no potential for direct effect. Designated for Hen Harrier. As per the NPWS Site-specific conservation objectives for Slieve Bloom Mountains SPA "Breeding pairs predominantly use the area within 5km of their nest site or centre of territory, though they can travel further." Hen Harriers in Ireland have been shown to range over varying distances depending on their gender (7.5km for females and 11.4km for males) (Arroyo et al. 2009; Irwin et al. 2012). Males have larger home ranges than females (average respective home range areas of 7.3 km² and 3.6 km² in Scotland and may feed as far as 10km from nest site. Females were found to hunt mainly within 300–500m of nest (Arroyo et al., 2009). Indirect impacts on this SCI species can be ruled out due to the buffering distance of approx. 25.3km, and the absence of a complete source-pathway-receptor chain. No plausible impact pathway linking the Proposed Development site to the SPA.

Designated Site	Proximity of Designated Site to Nearest Point of Subject Site	Rationale for Exclusion from Further Assessment
		<ul style="list-style-type: none"> No pathway for likely significant effect on this Natura 2000 Site was identified, and, therefore, the site is not located within the Likely ZOI and is not considered further in this assessment.
Charleville Wood SAC (Site Code: 000571)	9.5km west of Ballina (Geashill By) TDR node	<ul style="list-style-type: none"> Designated for alluvial forests and Desmoulin's Whorl Snail. The SAC is located approximately 9.5km west of the Ballina (Geashill By) TDR node, with the nearest watercourse (Annagharvey Stream) situated around 140m from the TDR works. The SAC supports specialised wet woodland and mollusc habitats not present within or adjacent to the Proposed Development. No suitable habitat for <i>Vertigo moulinsiana</i> was identified within the study area. Works in this area are temporary and confined to surface vegetation clearance and at grade surface modifications with no instream works or significant ground disturbance proposed near sensitive habitats. Given the intervening distance, lack of hydrological connectivity, and absence of suitable habitat, there is no plausible pathway for significant effects. No pathway for likely significant effect on this Natura 2000 Site was identified, and, therefore, the site is not located within the Likely ZOI and is not considered further in this assessment.

4.6.2 Natura 2000 Sites Within the Likely ZOI

Potential impact pathways have been identified between the Proposed Development and the remaining Natura 2000 sites identified to be within the ZOI of the Proposed Development. It is considered that these sites, outlined in **Table 12**, have the potential to be impacted by the Proposed Development. Therefore, the assessment of significance of potential effects that follows focuses on these Natura 2000 sites.

Table 12. Natura 2000 Sites Within the Likely ZOI and Rationale for Inclusion

Designated Site	Proximity of Designated Site to Nearest Point of Subject Site	Rationale for Inclusion for Further Assessment
River Boyne and River Blackwater SAC (002299)	17km north of the site	<ul style="list-style-type: none"> Designated for alluvial forests, alkaline fens, river lamprey, salmon and otter. Lamprey, salmon and otter are mobile species which could utilise waterbodies within the locality. Highly tenuous hydrological link between the Proposed Development site and the SAC, located nearly 25 river km downstream. Precautionary principle. Potential for indirect species disturbance/displacement impacts via potential impairment of water quality.
River Boyne and River Blackwater SPA (004232)	17km north of the site	<ul style="list-style-type: none"> Designated for kingfisher. Highly tenuous hydrological link between the Proposed Development site and the SPA, located nearly 25 river km downstream. Precautionary Principle

Designated Site	Proximity of Designated Site to Nearest Point of Subject Site	Rationale for Inclusion for Further Assessment
		<ul style="list-style-type: none"> Potential for indirect species disturbance/displacement impacts via potential impairment of water quality.
River Barrow and River Nore SAC (002162)	11.2km south of the site	<ul style="list-style-type: none"> Designated for terrestrial habitats, Killarney Fern, otter, anadromous fish species, and freshwater invertebrates. Highly tenuous hydrological link between the Proposed Development site and the SAC, located more than 30 river km downstream. Precautionary principle. Potential for indirect species disturbance/displacement impacts via potential impairment of water quality.

The likelihood of significant effects from the project to the Natura 2000 sites outlined above was determined based on several indicators including:

- Water quality.
- Habitat loss/alteration.
- Habitat or species fragmentation.
- Disturbance and/or displacement of species.

4.7 Assessment of Significance of Potential Effects on Relevant European Sites

As set out in **Section 4.6.2**, the following European sites are considered to be within the Zol of the Proposed Development:

- River Boyne and River Blackwater SAC (002299)
- River Boyne and River Blackwater SPA (004232)
- River Barrow and River Nore SAC (002162)

The following impacts could result in significant effects on the qualifying features and/or supporting habitats of the River Barrow and River Nore SAC:

- Waterborne pollution of qualifying or supporting aquatic habitats during construction and operation, particularly via the Leitrim Stream and Figile River which are hydrologically connected to the SAC.
- Alteration of hydrological regimes due to earthworks, drainage installation, and spoil deposition, potentially affecting downstream aquatic habitats.
- Disturbance/displacement of qualifying species such as otter, Atlantic salmon, brook lamprey, and white-clawed crayfish due to noise, vibration, and human activity during construction or impairment of water quality.
- Habitat fragmentation or degradation of riparian corridors used by mobile aquatic species, particularly at watercourse crossings.

The following impacts could result in significant effects on the qualifying features and/or supporting habitats of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA:

- Waterborne pollution of qualifying or supporting aquatic habitats from construction activities along the northern portion of the grid connection route, which drains to the Kinnafad Stream and ultimately to the River Boyne.

- Hydrological disruption due to trenching and directional drilling near sensitive aquatic features and potentially affecting downstream aquatic habitats.
- Disturbance/displacement of qualifying species such as otter, Atlantic salmon, river lamprey or kingfisher due to noise, vibration, and human activity during construction or impairment of water quality.
- Habitat fragmentation or degradation of riparian corridors used by mobile aquatic species, particularly at watercourse crossings.
- Collision mortality on Whooper Swans.

4.8 AA Screening Conclusion

The following sites have been assessed and can be screened out due to lack of credible source pathway–receptor connections, intervening distance, and absence of hydrological or ecological connectivity:

- Long Derries, Edenderry SAC (000925).
- Raheenmore Bog SAC (000582).
- Lough Ennell SPA (004044).
- Slieve Bloom Mountains SPA (004160).
- Charleville Woods SAC (000571).

These sites are either too distant, lack hydrological connection, or are not sensitive to the types of impacts likely to arise from the Proposed Development.

Following an examination of the Proposed Development and the likely impacts arising from construction and operation, it has been concluded that, in the absence of mitigation, there is potential for likely significant effects, or significant effects cannot be ruled out at this stage, on the following European sites:

- River Barrow and River Nore SAC (002162).
- River Boyne and River Blackwater SPA (004232).
- River Boyne and River Blackwater SAC (002299).

Therefore, it is determined that the Proposed Development should progress to a more detailed examination of effects on the integrity of these European sites through the preparation of a NIS which is detailed in the subsequent sections of this report.

5. Natura Impact Statement

The River Barrow and River Nore SAC (002162), River Boyne and River Blackwater SAC (002299) and River Boyne and River Blackwater SPA (004232) are located within the ZOI of the Proposed Development. Without mitigation, there is a possibility for significant effects on the qualifying features and supporting habitats of the SAC/SPA during construction, operation and/or decommissioning.

5.1 Assessment of Potential Effects & Associated Mitigation

5.1.1 Waterborne Pollution of Aquatic Habitats

The River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (004232) have been screened in for AA due to hydrological connectivity via the Leitrim Stream and Kinnafad Stream, respectively. These watercourses, while situated at

considerable downstream distances (approximately 25km to 30 km), provide indirect pathways through which pollutants generated during the construction, operation, or decommissioning of the Proposed Development could potentially affect the qualifying aquatic habitats and species of these SACs/SPA.

The River Barrow and River Nore SAC is designated for a range of aquatic and riparian features, including Atlantic salmon (*Salmo salar*), white-clawed crayfish (*Austropotamobius pallipes*), lamprey species, and alluvial forests. Similarly, the River Boyne and River Blackwater SAC supports qualifying interests such as river lamprey (*Lampetra fluviatilis*), salmon, otter (*Lutra lutra*), and alkaline fens. The River Boyne and River Blackwater SPA is designated for kingfisher (*Alcedo atthis*), a wetland and riparian species which requires high-quality aquatic habitats to support its prey resource. These features are sensitive to sedimentation, nutrient enrichment, and hydrological alteration.

During the construction phase, activities such as excavation, vegetation clearance, watercourse crossings, and spoil deposition pose a risk of introducing pollutants, particularly suspended solids, hydrocarbons, and concrete washout, into surface water pathways. Although the intervening landscape provides natural attenuation through sediment deposition, nutrient uptake and dilution, the precautionary principle requires that these risks be addressed through robust mitigation.

To prevent adverse effects on the integrity of the SACs/SPA, the following mitigation measures will be implemented (mitigation measures are fully set out in **Section 6**):

- Chemical and Fuel Storage: All chemicals and fuels will be stored in bunded containers with COSHH datasheets, located at least 15m from any watercourse. Bunds will be sized to contain 110% of the largest container or 25% of the total volume stored, whichever is greater.
- Drainage Management: Drainage from bunded areas will be diverted for safe collection and disposal. No direct discharges to watercourses will occur.
- Surface Water Control: SuDS will be employed to manage runoff, including swales, filter drains, check dams, and settlement ponds to capture and attenuate sediment-laden water.
- Construction Protocols: Refuelling will only occur in designated impermeable areas. Spill kits will be available onsite and vehicles, and staff will be trained in emergency response procedures.
- Concrete Washout: Washout areas will be lined and located away from drainage infrastructure. No wet batching will occur onsite.
- During the operational phase, the presence of hardstanding areas and access tracks may marginally alter surface water runoff characteristics. However, the development footprint is limited, and no pollutants or hydrological alterations are expected that could affect downstream habitats. The natural buffering capacity of the landscape will continue to intercept and filter surface water.

Decommissioning activities will mirror those of construction in scale and nature. These works will be temporary and localised, and the same mitigation measures and natural attenuation mechanisms will remain in place to prevent downstream transport of pollutants.

With the implementation of these mitigation measures and considering the embedded design features of the Proposed Development, it is concluded beyond reasonable scientific doubt that the project will not result in adverse effects on the integrity of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA due to waterborne pollution.

5.1.2 Alteration of Hydrological Regimes

The River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (004232) have been screened in for AA due to indirect hydrological connectivity via the Leitrim Stream and Kinnafad Stream, respectively. While the Proposed

Development is located entirely outside the boundaries of these Natura 2000 sites, construction activities, including earthworks, drainage installation, and spoil deposition, have the potential to alter surface and subsurface hydrological regimes, which could affect downstream aquatic habitats and qualifying species.

The River Barrow and River Nore SAC supports groundwater-dependent habitats such as petrifying springs [7220], alluvial forests [91E0], and watercourses with *Ranunculus fluitans* and *Callitriche-Batrachium* vegetation [3260]. Similarly, the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA includes sensitive aquatic habitats such as alkaline fens [7230] and alluvial forests [91E0], as well as qualifying species including Atlantic salmon (*Salmo salar*), lamprey species, white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and kingfisher. These features are vulnerable to changes in water flow, sediment transport, and nutrient cycling.

Although ecological surveys confirmed that the habitats within the Proposed Development footprint do not correspond to Annex I habitats and do not support qualifying interest species, other than scarce records of otter and brook lamprey as determined during field surveys, the precautionary principle requires that potential indirect effects on downstream SAC/SPAs be addressed through appropriate mitigation.

To prevent adverse effects on the hydrological regimes and habitat connectivity of the screened-in European sites, the following mitigation measures will be implemented (mitigation measures are fully set out in **Section 6**):

- Hydrological Design: Drainage infrastructure will be designed to replicate existing flow patterns and avoid concentration or diversion of runoff. This includes the use of Sustainable Drainage Systems (SuDS) such as swales, filter drains, and level spreaders.
- Sediment Control: Silt fences, settlement ponds, and straw bales will be installed to intercept and attenuate sediment-laden runoff before it enters any watercourse.
- Buffer Zones: No works will be undertaken within 30m of sensitive hydrological features unless specifically assessed and approved. This buffer will protect riparian zones and maintain natural infiltration and flow regimes.
- Use of clear-span culverts and HDD at watercourse crossings

These measures are designed to maintain the integrity of downstream hydrological systems and prevent any significant alteration of flow dynamics that could affect the conservation objectives of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA.

Given the absence of direct overlap, the degraded nature of onsite watercourses, and the implementation of these mitigation measures, it is concluded beyond reasonable scientific doubt that the Proposed Development will not result in adverse effects on the integrity of the screened-in European sites due to hydrological changes or habitat connectivity disruption.

5.1.3 Disturbance/Displacement of Qualifying Aquatic and Riparian Species

The River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (004232) have been screened in for Appropriate Assessment due to the presence of qualifying aquatic and riparian species that are sensitive to disturbance, including Atlantic salmon (*Salmo salar*), brook and river lamprey (*Lampetra planeri*, *L. fluviatilis*), white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and kingfisher (*Alcedo atthis*)

Although the Proposed Development is located entirely outside the boundaries of these Natura 2000 sites, and ecological surveys confirm that the habitats within the development footprint do not support qualifying interest species or Annex I habitats, the precautionary principle requires that potential indirect effects, particularly those arising from construction-related disturbance, be assessed and mitigated.

Field surveys recorded otter spraint along the Leitrim River, confirming the presence of this species within the study area. While no holts, couches, or breeding/resting sites were identified, construction activities such as excavation, vegetation clearance, watercourse crossings, and increased human presence may temporarily disrupt commuting or foraging routes. Similarly, instream noise and vibration could affect fish behaviour and spawning success, particularly for salmonids and lamprey species. One brook lamprey was recorded during field surveys. Potential impairment of water quality could also affect the prey resources of QI/SCI species such as otter or kingfisher.

Although whooper swan are not a QI for the River Boyne and River Blackwater SAC, the presence of a wintering whooper swan population associated with the River Boyne and River Blackwater SAC is noted in the site synopsis. Whooper swan occurring in and around the Proposed Development could potentially be subject to disturbance during construction, decommissioning or collision mortality during operation.

To minimise potential disturbance/displacement of aquatic/riparian QI/SCI species, the mitigation measures outlined in **Section 5.1.1** will be implemented in relation to avoiding or reducing the risk of waterborne pollution as a result of the Proposed Development.

To minimise disturbance to qualifying species of the screened-in SACs, the following mitigation measures will be implemented:

- Directional Lighting: All site lighting will be fitted with cowls and directed away from riparian zones to prevent light spill into sensitive habitats.
- Noise Suppression: EC-compliant machinery will be used, and best practice construction protocols will be followed to minimise noise and vibration.
- Seasonal Constraints: Where feasible, works near watercourses will be scheduled outside sensitive periods for aquatic species, such as spawning seasons.
- Riparian Protection: Vegetation along riparian corridors will be retained where possible, and disturbed areas will be reinstated using native species to maintain ecological connectivity.

These measures are designed to ensure that any disturbance impacts are temporary, localised, and do not compromise the conservation objectives of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA.

Given the absence of direct overlap, the degraded nature of onsite aquatic habitats, and the implementation of targeted mitigation measures, it is concluded beyond reasonable scientific doubt that the Proposed Development will not result in adverse effects on the integrity of the screened-in European sites due to disturbance or displacement of qualifying aquatic and riparian species.

5.1.4 Collision Risk

Although whooper swan are not a QI for the River Boyne and River Blackwater SAC, the presence of a wintering whooper swan population associated with the River Boyne and River Blackwater SAC is noted in the site synopsis and as a result collision mortality on Whooper Swans is considered and appraised on a precautionary basis.

The detection of nocturnal whooper swan flight calls is indicative of some migratory movements through the area in which the Proposed Development is located, while observations from visual surveys confirm the presence of a dispersed and mobile wintering population in the region. Collision risk has been appraised on a precautionary basis, following guidance outlined in Percival (2003, 2007). The assessment considers both the sensitivity of the receptor and the magnitude and probability of the predicted impact. A significance matrix (see **Table 13**) was used to determine the overall significance of potential effects.

Table 13. Determination of Magnitude Effects (Percival, 2003)

Magnitude	Description
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. Guide: < 20% of population / habitat remains
High	Major loss or major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed. Guide: 20-80% of population/ habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed.
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1-5% of population/ habitat lost
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the “no change” situation. Guide: < 1% population/ habitat lost

The significance of potential effects is assessed by cross tabulating the magnitude of effects and bird sensitivity to predict significance of each potential effect. Population status, distribution and trends of potentially affected species such as migratory winter birds should be taken into consideration when undertaking the assessment. Significant ratings are interpreted as follows, very low and low should not normally be of concern however normal design care should be undertaken to minimise effects, medium represents a potentially significant effect that requires careful individual assessment, while very high and high represents a highly significant effect on bird populations. A significance matrix table, combining magnitude and sensitivity to assess overall significance is presented in **Table 14**.

Table 14 Significance Matrix (Percival, 2003)

Significance		Sensitivity			
		Very High	High	Medium	Low
Magnitude	Very High	Very High	Very High	High	Medium
	High	Very High	Very High	Medium	Low
	Medium	Very High	High	Low	Very Low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

Scientific literature indicates low collision mortality rates for Whooper Swans, even at sites with high transit activity. For example, Fijn et al. (2012) recorded only one fatality among 1,664 transit flights through operational wind farms. Similarly, Hötter et al. (2006) reported a single Whooper Swan fatality across 46 wind farms in eight countries. Recommended avoidance rates from Scottish Natural Heritage (SNH, 2010) are 99.5%, suggesting high micro-avoidance of turbines.

Radar-based studies (Desholm & Kahlert, 2005) have shown that macro-avoidance rates during nocturnal periods are comparable to or higher than those observed during daylight, indicating effective avoidance behaviour even under low visibility conditions.

Based on these findings, the predicted collision risk for Whooper Swan is 0.01 individuals per year. This equates to approximately 0.000% of national population, 0.002% county population and 0.029% local population.

Given the low predicted collision risk, the high avoidance rates documented in peer-reviewed literature, and the limited scale of disturbance, it is concluded beyond reasonable scientific doubt that the Proposed Development will not result in adverse effects on the integrity of the River Boyne and River Blackwater SAC in relation to Whooper Swan.

5.1.5 Fragmentation and Degradation of Riparian Corridors

Habitat fragmentation is defined as the "reduction and isolation of patches of natural environment" (Hall et al., 1997, cited in Franklin et al., 2002), resulting in the spatial separation of areas that were previously more continuous. Fragmentation can negatively affect species by reducing gene flow, increasing isolation of populations, and limiting access to foraging, breeding, or sheltering resources.

The River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA have been screened in for Appropriate Assessment due to the presence of qualifying aquatic and riparian species that rely on continuous/quality habitat corridors for foraging, commuting, and breeding. These include Atlantic salmon (*Salmo salar*), lamprey species, white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and kingfisher (*Alcedo atthis*) all of which are sensitive to habitat fragmentation and degradation of riparian zones.

Although the Proposed Development is located entirely outside the boundaries of these European sites, and ecological surveys confirm that the development footprint does not overlap with Annex I habitats or support regularly occurring populations of qualifying interest species, the precautionary principle requires that potential indirect effects, particularly those arising from disruption of riparian connectivity, be assessed and mitigated.

Riparian corridors serve as critical ecological linkages for mobile aquatic species. Infrastructure installation, vegetation clearance, and watercourse crossings during construction have the potential to fragment these habitats, impeding movement and reducing habitat quality. While no direct connectivity exists between the development footprint and the designated sites, hydrological connections via the Leitrim Stream and Kinnafad Stream mean that any degradation of riparian zones could have downstream ecological consequences.

To prevent adverse effects on riparian connectivity and habitat structure, the following mitigation measures will be implemented (Mitigation measures are fully set out in **Section 6**):

- Riparian Continuity: Clear-span culverts and HDD will be used at watercourse crossings to maintain natural channel profiles and avoid instream disturbance.
- Vegetation Retention: Riparian vegetation will be retained where possible, and disturbed areas will be reinstated using locally appropriate native species.
- Exclusion Zones: Sensitive riparian areas will be fenced off during construction to prevent encroachment and preserve habitat integrity.

These measures are designed to ensure that riparian corridors remain ecologically functional and connected, thereby safeguarding the movement and habitat use of qualifying species associated with the screened-in SACs/SPA.

Given the absence of direct overlap, the degraded nature of onsite aquatic habitats, and the implementation of targeted mitigation measures, it is concluded beyond reasonable scientific doubt that the Proposed Development

will not result in adverse effects on the integrity of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA due to habitat fragmentation.

5.1.6 Cumulative/In-combination Effects

In accordance with Article 6(3) of the Habitats Directive, the potential for cumulative or in-combination effects with other plans or projects has been considered. Cumulative impacts arise where the combined influence of multiple developments, including the Proposed Development, may give rise to significant effects on European sites, even if individual effects are insignificant.

A review of other plans and projects in the surrounding area was conducted as outlined in **Section 4.3**. This included assessment of forestry operations, agriculture, infrastructure, and renewable energy developments (including wind farms and grid upgrades). This review did not identify any projects with overlapping or proximate hydrological catchments that would contribute to cumulative pressures on the River Barrow and River Nore SAC or the River Boyne and River Blackwater SAC, when considered in combination with the Proposed Development.

5.1.6.1 River Barrow and River Nore SAC (Site Code: 002162)

This SAC is designated for a wide range of freshwater and coastal habitats, as well as several aquatic species including Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), river and brook lamprey (*Lampetra fluviatilis* and *L. planeri*), twaite shad (*Alosa fallax*), white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*), and the Nore freshwater pearl mussel (*Margaritifera durrovensis*).

Relevant threats and pressures identified for this SAC in the Natura 2000 Standard Data Form include:

- Water pollution from agriculture and forestry.
- Changes to hydrology from drainage and development.
- Physical barrier effects on migratory fish.
- Invasive species.
- Urban and infrastructure development.

However, the Proposed Development does not introduce any new significant sources of these pressures. Felling is limited to 21ha and no widescale forest clearance is proposed. Additionally, the distance of over 30km of fluvial separation and the Proposed Development location in a distinct WFD sub-catchment eliminates any potential for in-combination physical disturbance or habitat encroachment on designated features of this SAC.

While other developments exist within the wider Barrow catchment, no projects were identified within the same sub-catchment or upstream of the SAC that would act cumulatively with the Proposed Development. The absence of spatial or functional overlap, combined with the attenuating capacity of the landscape, ensures that the Proposed Development will not contribute to cumulative pressures on the SAC's qualifying interests. Therefore, the Proposed Development does not contribute to cumulative pressures that could affect the conservation objectives of this site.

5.1.6.2 River Boyne and River Blackwater SAC (Site Code: 002299)

This SAC is located approximately 25km downstream of the Proposed Development via the Rogerstown Stream and River Boyne and is designated for river lamprey, salmon, otter, alkaline fens, and alluvial forests. The conservation status of these features is dependent on maintenance of good water quality, adequate hydrological regimes, and unfragmented ecological corridors.

Identified pressures on this SAC include:

- Nutrient loading and pollution (from agriculture, wastewater, and other sources).
- Hydrological changes including groundwater abstraction and surface drainage.
- Collision risk.
- Infrastructure and urbanisation.
- Spread of invasive species.

The Proposed Development is hydrologically connected to the Boyne catchment via minor streams (e.g. Boyne_020), but these are small, low-energy watercourses with no evidence of supporting QI species. There is no overlap with sensitive fen or forest habitats, and there are no known cumulative projects in the upstream Rogerstown sub-catchment that would compound impacts on the SAC's QIs. No other developments were identified within the same upstream sub-catchment that would act cumulatively to affect water quality, hydrology, or species movement. Therefore, the Proposed Development does not contribute to cumulative pressures that could affect the conservation objectives of this site.

5.1.6.3 River Boyne and River Blackwater SPA (Site Code: 004232)

This SPA is designated for kingfisher. The conservation status of this feature is dependent on availability of suitable habitat, maintenance of high-water quality, absence of barriers to connectivity, and avoidance of disturbance at breeding sites.

Identified pressures on this SPA include:

- Dispersed habitation
- Roads/motorways
- Urbanised areas, human habitation
- Human induced changes in hydraulic conditions

This SPA is located approximately 25km downstream of the Proposed Development via the Rogerstown Stream and River Boyne. There are no known cumulative projects in the upstream Rogerstown sub-catchment that would compound impacts on the SPA. The site's drainage design, including the use of interceptors and swales, ensures that surface water runoff is managed at source and will not impact downstream hydrology or nutrient status. In addition, operational activities will not result in further loading to the system. There are no known cumulative projects in the upstream Rogerstown sub-catchment that would compound impacts on kingfisher. No other developments were identified within the same upstream sub-catchment that would act cumulatively to affect water quality, hydrology, or species movement. Therefore, the Proposed Development does not contribute to cumulative pressures that could affect the conservation objectives of this site.

5.1.6.4 Cumulative/In-combination Effects Conclusion

Although other wind energy developments exist within the wider region, they are either located outside of shared hydrological pathways or are subject to equivalent drainage and pollution controls. Therefore, no credible pathway for cumulative hydrological or species-level impacts exists. Furthermore, based on the collision risk assessment for the Proposed Development and the findings of assessments for cumulative projects considered, it is determined that the Proposed Development will not result in significant in-combination or cumulative effects on the conservation objectives of the River Boyne and River Blackwater SAC in relation to Whooper Swan.

Based on the scale and location of the Proposed Development, the absence of direct pathways to designated features, the intervening distances and sub-catchment divisions, and the implementation of best-practice site management measures, it is objectively concluded that the Proposed Development will not result in significant

in-combination or cumulative effects on the conservation objectives of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA.

6. Mitigation Measures

In addition to embedded design (refer to **Section 4.2.4.1**), in order to mitigate potential impacts during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes. These measures are set out in the CEMP.

A CEMP (**Appendix 3**) has been developed for the Proposed Development to ensure adequate protection of the environment. The CEMP will be a key contract document and the appointed contractor will be required to implement it in full. All personnel working on the Proposed Development will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP.

Emergency procedures will be developed by the main contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with best practice standards and legislative requirements including but not limited to the Environmental Protection Agency Act, 1992 (as amended), Waste Management Act, 1996 (as amended) and the Safety, Health and Welfare at Work Act, 2005 (as amended).

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards.
- All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

6.1 Surface Water Management

Good practice construction techniques outlined in the CEMP will be adopted for the management of sediment and surface water runoff generated during the construction phase of the Proposed Development. Sustainable Drainage Systems (SuDS) will be used where applicable to replicate natural drainage patterns. Key features include:

- Swales and filter drains to intercept and convey runoff.
- Check dams and level spreaders to reduce flow velocity and promote infiltration.
- Settlement ponds and silt traps to capture suspended solids before discharge.

- Clean water will be diverted around work areas to prevent contamination.
- No direct discharges to watercourses; all outflows will be via vegetated dispersion channels.

6.2 Instream Works

Where instream works are required for watercourse crossings and culverts, the following measures will be implemented to safeguard water quality and aquatic habitats:

- All works will comply with IFI (2016), TII (2008), and CIRIA C648 (2006) guidelines.
- Instream works will only occur within the IFI permitted window (July 1st–September 30th) to avoid sensitive spawning periods.
- A qualified Environmental Clerk of Works (ECOW) will oversee all instream activities and conduct upstream/downstream water quality monitoring.
- Silt fences and sediment controls will be installed and maintained to prevent runoff into watercourses.
- Works areas will be fenced off, with geotextile silt membranes and Heras fencing used to prevent encroachment.
- Precast concrete culverts will be used to minimise instream disturbance.
- Vegetation will be retained where possible; disturbed areas will be promptly reinstated.
- Daily inspections of sediment controls will be carried out, with increased monitoring during high-risk activities or adverse weather.

6.3 Pollution Control

Mitigation measures in relation to pollution prevention will be implemented as follows:

- A 20m buffer will be maintained around EPA-mapped watercourses, with limited access only for essential works (e.g., crossings).
- No storage or parking of machinery within 15m of watercourses.
- Double silt fencing will be installed upslope and downgradient of works near watercourses.
- Drainage features will be clearly marked on site plans; rainwater will be diverted away from active areas.
- Excavations will be kept open for minimal durations; dewatering will use filter media and settlement ponds.
- Spoil and stockpiles will be located away from drainage systems and regraded to prevent runoff.
- Silt fences and traps will be installed and maintained around stockpiles and site boundaries.
- Erosion control matting will be used on exposed slopes; disturbed areas will be promptly re-seeded.
- Daily inspections and maintenance of sediment controls will be carried out, especially after rainfall.
- Method statements will address flood forecasting and safe removal of materials from flood zones.
- Bunded storage areas for fuels and chemicals will be located >15m from watercourses, with spill pallets used during transport.
- All containers will be labelled and stored with COSHH documentation.
- Refuelling will occur only in impermeable designated areas; mobile refuelling will use double-skinned tanks.
- No refuelling or machinery tracking within 15m of watercourses.
- Spill kits and absorbent materials will be available onsite and in vehicles.
- Drip trays will be placed under static plant; hoses and valves will be regularly inspected.
- Wastewater from welfare facilities will be stored in sealed tanks and removed by licensed contractors.
- Ready-mix concrete will be delivered to site; no onsite batching will occur.

- Wet concreting will be subject to a risk assessment, with measures to prevent alkaline wastewater discharge.
- Concrete pouring will take place in designated, protected areas (e.g., lined with geosynthetic material).
- Washout of concrete trucks will occur only in impermeable, contained areas, away from drains and watercourses.
- Wash water will be collected in lined containers, regularly inspected and emptied to prevent overflow or leakage.
- Washout areas will be clearly marked and located away from drainage infrastructure and sensitive receptors.

6.4 Hydrological and Hydrogeological Flow

To prevent disruption of natural water flow paths and surface water regimes:

- A site-specific surface water management system based on SuDS principles will be implemented, including swales, filter drains, check dams, level spreaders, and settlement ponds.
- Watercourse crossings will be designed to OPW Section 50 standards, sized for 1-in-100-year flood events plus climate change allowance, and constructed to maintain flow continuity with minimal instream disturbance.
- HDD will be used for sensitive crossings (e.g., Leitrim Stream and Bord na Móna rail track), with drill paths set at least 1.5m below the watercourse bed to avoid interaction with shallow aquifers or groundwater-dependent ecosystems.
- Drainage infrastructure will replicate pre-development runoff rates and avoid increasing downstream flood risk.
- Dewatering will follow CIRIA C750 best practice, using shallow recharge wells to maintain groundwater levels and confining activity to localised zones.
- Cable trenches will be sealed and backfilled to prevent preferential flow paths.
- Groundwater levels will be monitored throughout construction, with dewatering practices adjusted as needed.

6.5 Riparian Habitat Protection

To protect the ecological integrity and connectivity of riparian habitats supporting qualifying aquatic species:

- Riparian vegetation will be retained where possible and reinstated using native species following construction.
- Works adjacent to riparian zones will be fenced off and protected using geotextile membranes and silt fencing.
- Monitoring of riparian habitat condition will be undertaken pre- and post-construction to ensure ecological integrity is maintained.

6.6 Monitoring and Oversight

Water quality monitoring during the construction phase will be undertaken by the applicant for the surface water catchments that serve the Proposed Development to ensure that none of the tributaries of the main channels are carrying pollutants or suspended solids. Monitoring will be carried out at a specified frequency on these catchments.

- ECoW will oversee all sensitive works and conduct water quality monitoring.
- Parameters monitored include turbidity, pH, total suspended solids, hydrocarbons and metals.
- Monitoring will be intensified during high-risk activities and rainfall events.
- Records will be maintained and made available to the planning authority.

7. Integrity Assessment of Screened-In European Sites

The following conclusions are drawn in respect of the River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (004232), which were screened in due to hydrological connectivity and the presence of qualifying aquatic/riparian species sensitive to pollution, disturbance, and habitat fragmentation.

7.1 River Barrow and River Nore SAC (Site Code: 002162)

The River Barrow and River Nore SAC is located approximately 30 km downstream of the Proposed Development via the Leitrim Stream and Figile River. The SAC is designated for a range of Annex I habitats and Annex II species, including:

- Alluvial forests [91E0].
- Petrifying springs [7220].
- Old sessile oak woods [91A0].
- Watercourses with *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation [3260].
- Atlantic salmon (*Salmo salar*).
- Brook and river lamprey (*Lampetra planeri*, *L. fluviatilis*).
- White-clawed crayfish (*Austropotamobius pallipes*).
- Otter (*Lutra lutra*).
- Desmoulin's whorl snail (*Vertigo moulinsiana*).

There is no spatial overlap between the Proposed Development and the SAC, and no qualifying habitats occur within the development footprint. Aquatic surveys confirmed that the Leitrim Stream is of low ecological value, with poor substrate, slow flow, and degraded water quality unsuitable for salmonid spawning or lamprey habitation. A single brook lamprey was recorded, but no evidence of a sustainable population was found. Otter spraint was observed, but no holts, couches, or breeding sites were identified, and the riparian habitat was deemed unsuitable for regular use by otters.

Potential impacts during construction include sediment mobilisation, noise, vibration, and temporary disturbance. However, these are confined to areas of low ecological value and are mitigated through embedded design and mitigation measures, including:

- Surface water management using SuDS.
- Pollution prevention protocols.
- Riparian buffer zones.
- Restricted working hours and directional lighting.

- Monitoring of water quality and habitat condition.

Given the significant downstream distance, the absence of qualifying habitats or species or regular populations of same within the site, and the implementation of mitigation measures, it is concluded beyond reasonable scientific doubt that the Proposed Development will not adversely affect the integrity of the River Barrow and River Nore SAC, either alone or in combination with other plans or projects, in view of the site's conservation objectives.

7.2 River Boyne and River Blackwater SAC (Site Code: 002299)

The River Boyne and River Blackwater SAC lies approximately 25 km downstream of the Proposed Development via the Rogerstown Stream and River Boyne. The SAC is designated for:

- Alkaline fens [7230].
- Alluvial forests [91E0].
- Atlantic salmon (*Salmo salar*).
- Lamprey species (*Lampetra fluviatilis*, *L. planeri*).
- White-clawed crayfish (*Austropotamobius pallipes*).
- Otter (*Lutra lutra*).

Field surveys indicate that the northern portion of the Proposed Development, which drains to the Rogerstown Stream, supports limited aquatic biodiversity. The stream is narrow, shallow and hydromorphologically modified, with poor substrate and stagnant flow. No suitable habitat for crayfish or lamprey was identified, and no evidence of otter activity was found within the northern section of the site.

Potential impacts include waterborne pollution, hydrological alteration, and disturbance during construction and decommissioning. However, these are mitigated through:

- Use of clear-span culverts and HDD at watercourse crossings.
- Bunded storage of fuels and chemicals.
- Sediment control structures.
- Riparian vegetation retention and reinstatement.
- Monitoring of groundwater and surface water flow.

The operational phase will not generate emissions or discharges that could affect downstream habitats, and decommissioning activities will be temporary and localised.

Given the degraded nature of onsite watercourses, the absence of qualifying interest species or habitats, and the downstream separation from the SAC, it is concluded beyond reasonable scientific doubt that the Proposed Development will not adversely affect the integrity of the River Boyne and River Blackwater SAC, either alone or in combination with other plans or projects, in view of the site's conservation objectives.

7.2.1 River Boyne and River Blackwater SPA (Site Code: 004232)

The River Boyne and River Blackwater SPA lies approximately 25km downstream of the Proposed Development via the Rogerstown Stream and River Boyne. The SPA is designated for:

- Kingfisher (*Alcedo atthis*) [A229]

Field surveys indicate that the northern portion of the Proposed Development, which drains to the Rogerstown Stream, supports limited aquatic biodiversity. The stream is narrow, shallow and hydromorphologically modified, with poor substrate and stagnant flow. Kingfisher was recorded on one occasion during hinterland surveys to the north of TR18 (c. 4.2km west of the Proposed Development), confirming the presence of this species in the wider area. There is no potentially suitable kingfisher nesting or foraging habitat within the Proposed Development.

Potential impacts include waterborne pollution, hydrological alteration, and disturbance during construction and decommissioning. However, these are mitigated through:

- Use of clear-span culverts and HDD at watercourse crossings.
- Bunded storage of fuels and chemicals.
- Sediment control structures.
- Riparian vegetation retention and reinstatement.
- Monitoring of groundwater and surface water flow.

The operational phase will not generate emissions or discharges that could affect downstream habitats, and decommissioning activities will be temporary and localised.

Given the degraded nature of onsite watercourses, the absence of a regularly occurring population of kingfisher, and the downstream separation from the SPA, it is concluded beyond reasonable scientific doubt that the Proposed Development will not adversely affect the integrity of the River Boyne and River Blackwater SPA, either alone or in combination with other plans or projects, in view of the site's conservation objectives.

7.3 Residual Impacts

It has been concluded that, in the absence of mitigation, the proposal has potential for habitat, water quality and species disturbance/displacement impacts within a number of Natura 2000 sites.

Mitigation measures have been prescribed with regards to, in particular, the protection of water quality and aquatic/riparian habitats and species, primarily during construction.

With the implementation of the embedded design set out in **Section 4.2.4.1** and the best-practice and targeted mitigation measures set out in **Section 6**, it is objectively concluded that significant adverse residual impacts on the Conservation Objectives of any Natura 2000 sites, including the River Barrow and River Nore SAC (Site Code: 002162), the River Boyne and River Blackwater SAC (Site Code: 002299) and the River Boyne and River Blackwater SPA (Site Code: 004232), will not occur as a result of any phase of the Proposed Development, either independently or in combination with other plans or projects.

7.4 Conclusion

This NIS has been prepared in accordance with the requirements of the Habitats Directive (92/43/EEC), the Birds Directive (2009/147/EC), the European Communities (Birds and Natural Habitats) Regulations 2011, and Part XAB of the Planning and Development Act 2000 (as amended). It reflects best scientific knowledge and current guidance, including relevant case law and ecological assessment standards.

Following Appropriate Assessment Screening, three European sites were determined to lie within the potential ZOI of the Proposed Development:

- River Barrow and River Nore SAC (Site Code: 002162).
- River Boyne and River Blackwater SAC (Site Code: 002299).

- River Boyne and River Blackwater SPA (Site Code: 004232).

These sites were screened in due to hydrological connectivity via the Leitrim Stream, Figile River, and Kinnafad Stream, and the presence of qualifying interests sensitive to water quality, hydrological changes, and disturbance. The qualifying interests include Atlantic salmon (*Salmo salar*), brook lamprey (*Lampetra planeri*), white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and kingfisher (*Alcedo atthis*), all of which are vulnerable to pollution, sedimentation, and habitat fragmentation.

An AA was undertaken in accordance with Article 6(3) of the Habitats Directive. The AA identified the following potential impacts that could result in significant effects on the qualifying features and supporting habitats of these SACs/SPA:

- Waterborne pollution during construction and operation, particularly from sediment, hydrocarbons, and concrete washout.
- Alteration of hydrological regimes, including changes to surface water flow, groundwater levels, and drainage patterns.
- Disturbance/displacement of qualifying species due to noise, vibration, lighting, and human activity during construction or impairment of water quality.
- Fragmentation or degradation of riparian corridors, which serve as ecological linkages for mobile aquatic species.

These impacts were assessed in detail using the results of ecological surveys, hydrological analysis, and design documentation. Embedded and site-specific mitigation measures have been incorporated into the Proposed Development to ensure that these risks are effectively managed.

On the basis of objective information and beyond reasonable scientific doubt, with the implementation of all mitigation measures, it is concluded that the Proposed Development, either alone or in combination with other plans or projects, will not result in adverse effects on the integrity of the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA, in view of their conservation objectives.

8. References

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Appendix 1

Stages of Appropriate Assessment

Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.

If it can be concluded that no significant impacts to Natura 2000 Sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for a more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 Site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment than Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.

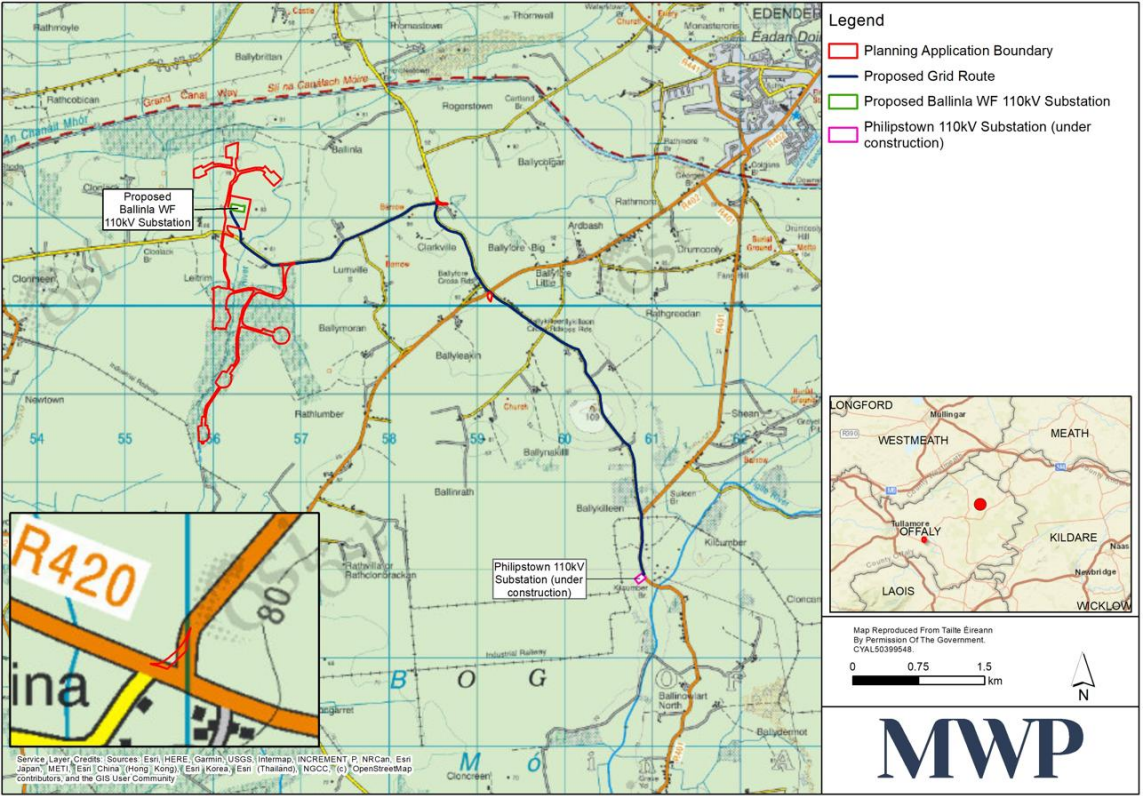
Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

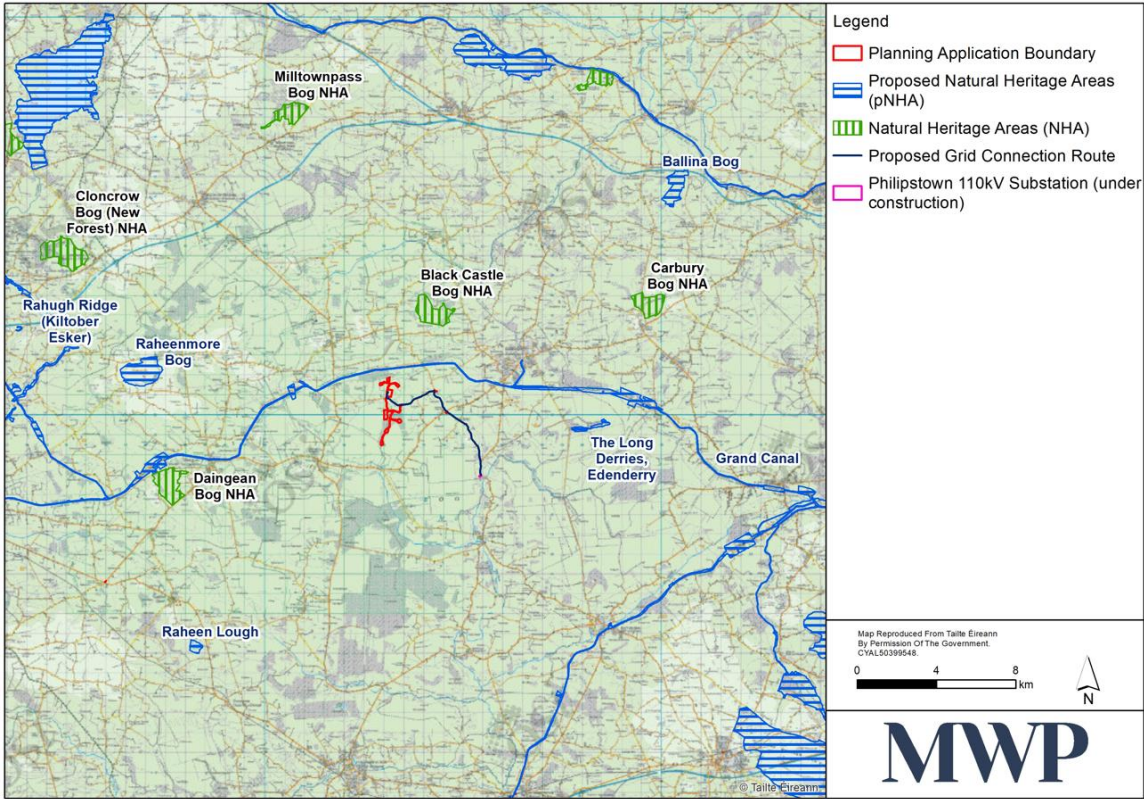
The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 Site where no less damaging solution exists.

Appendix 2

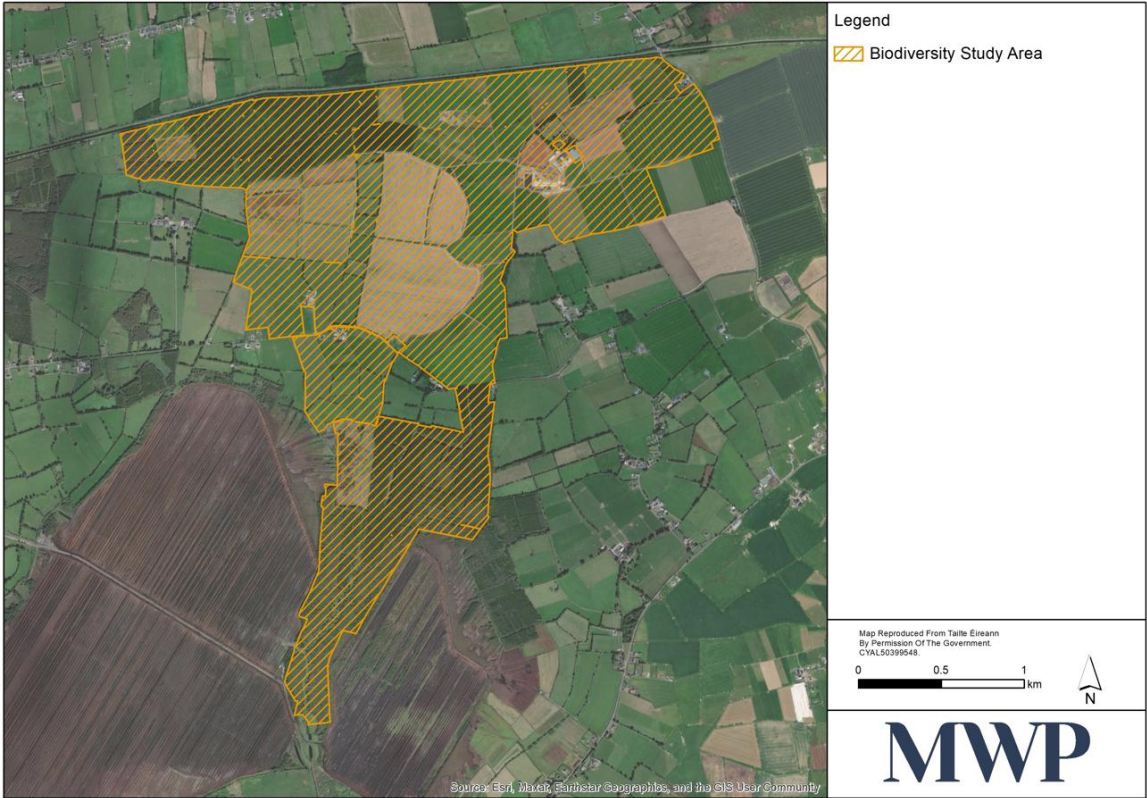
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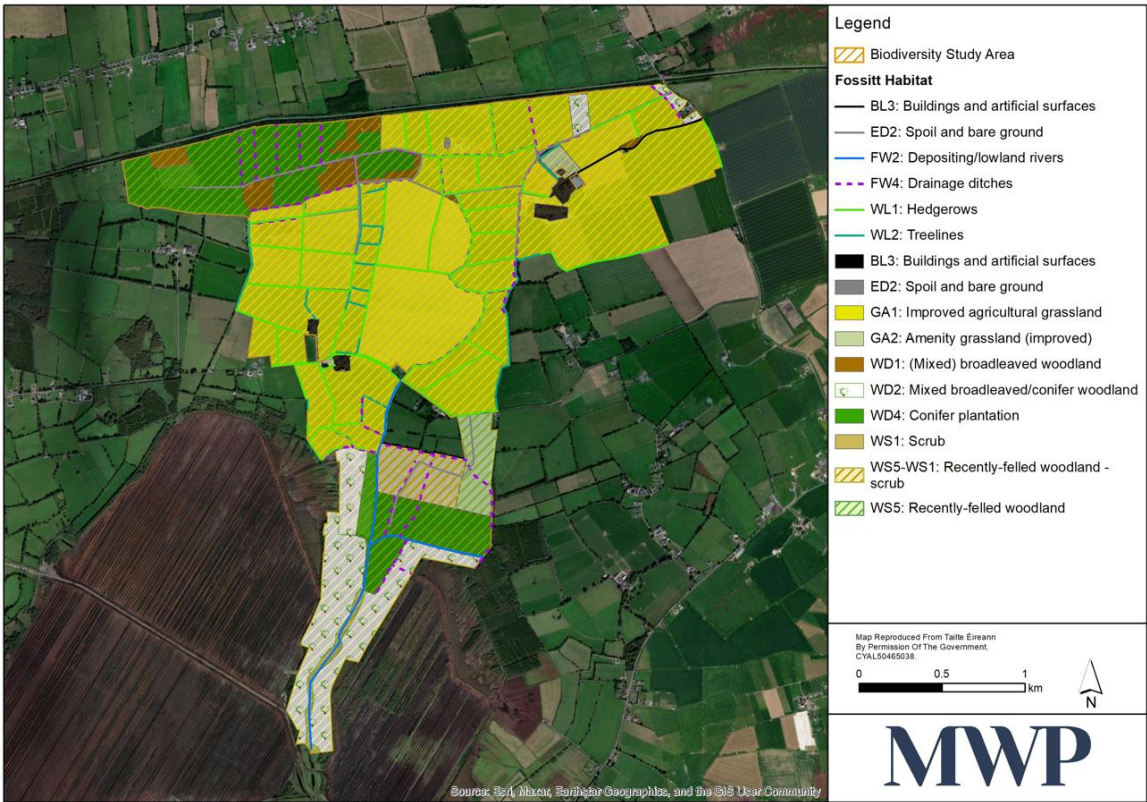
Proposed Development



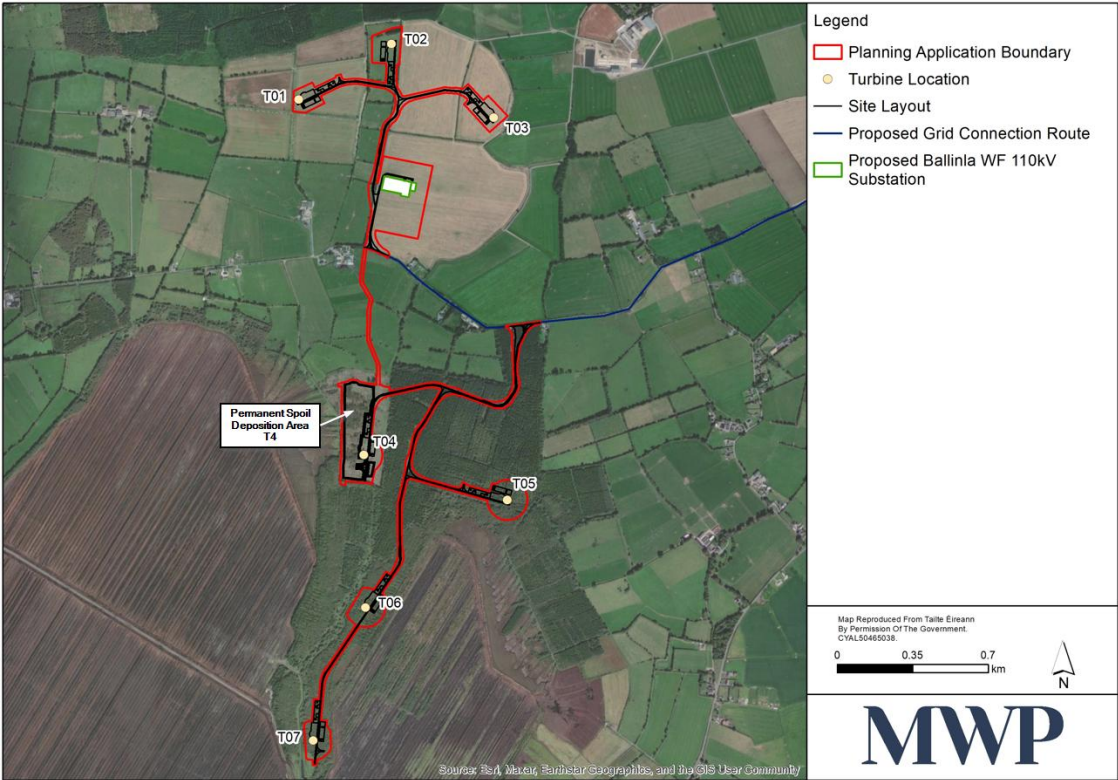
NHAs and pNHAs within the Environs of the Study Area



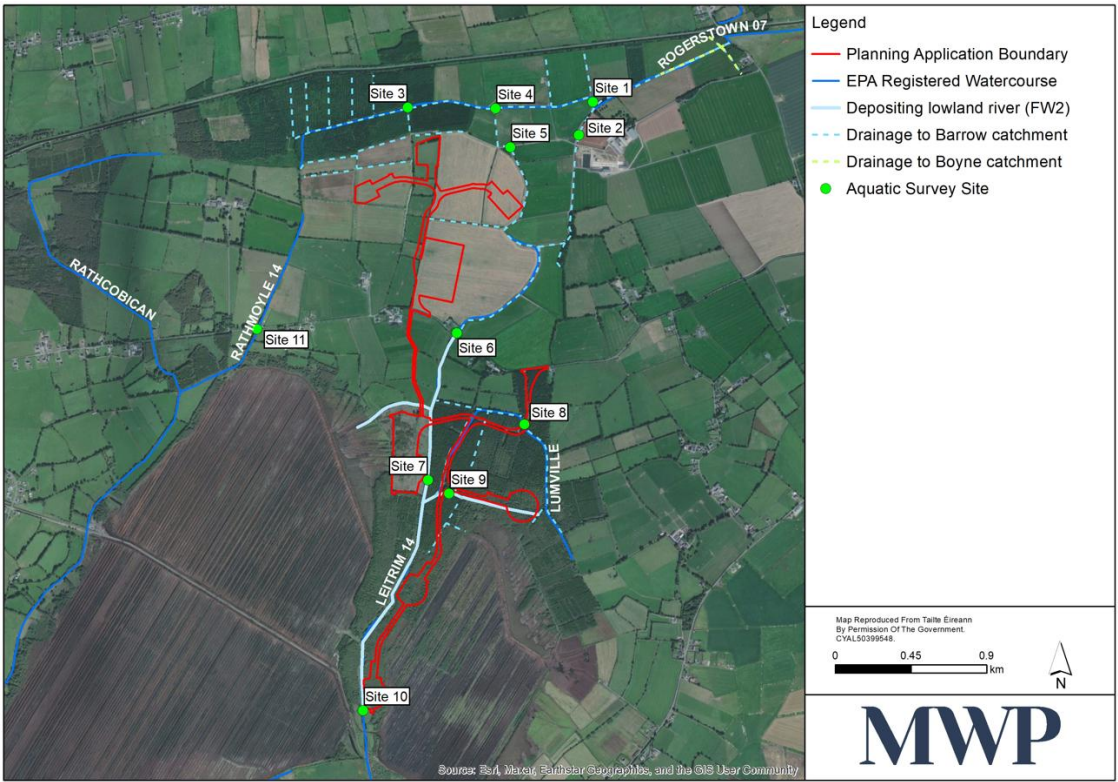
Biodiversity Study Area



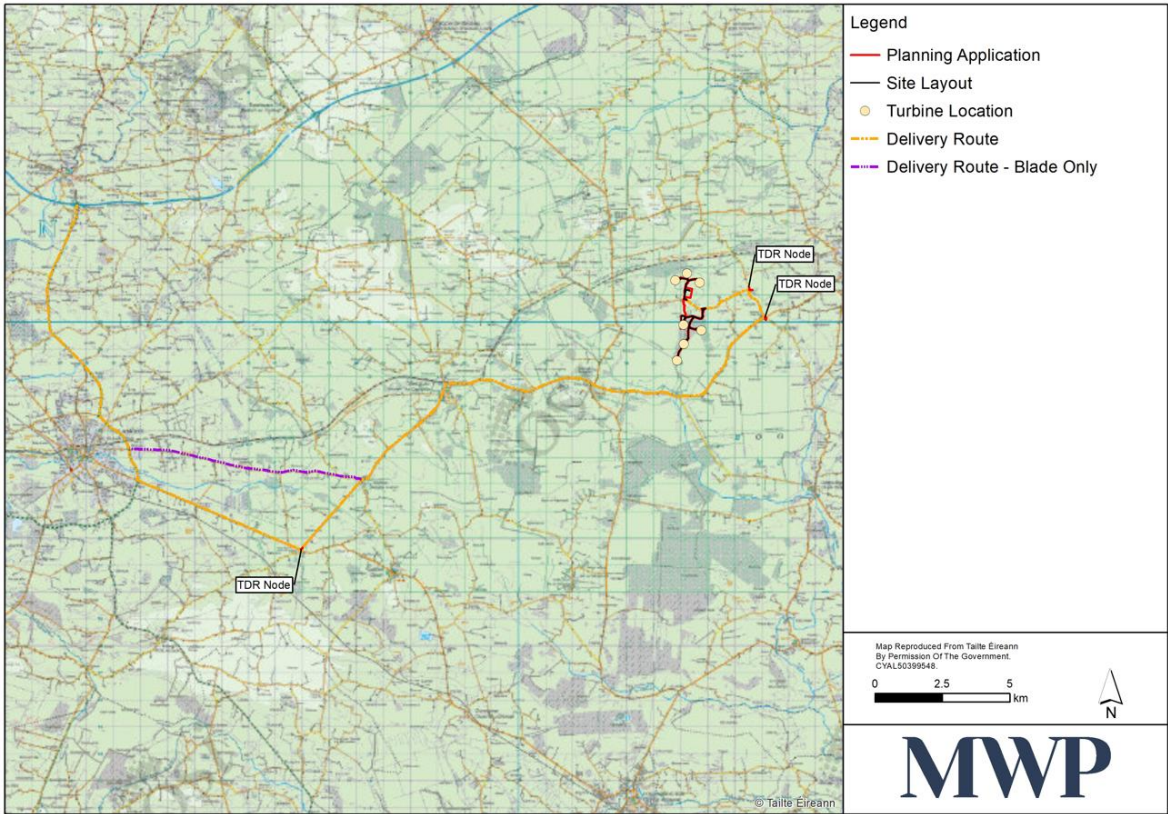
Study Area Habitat Map



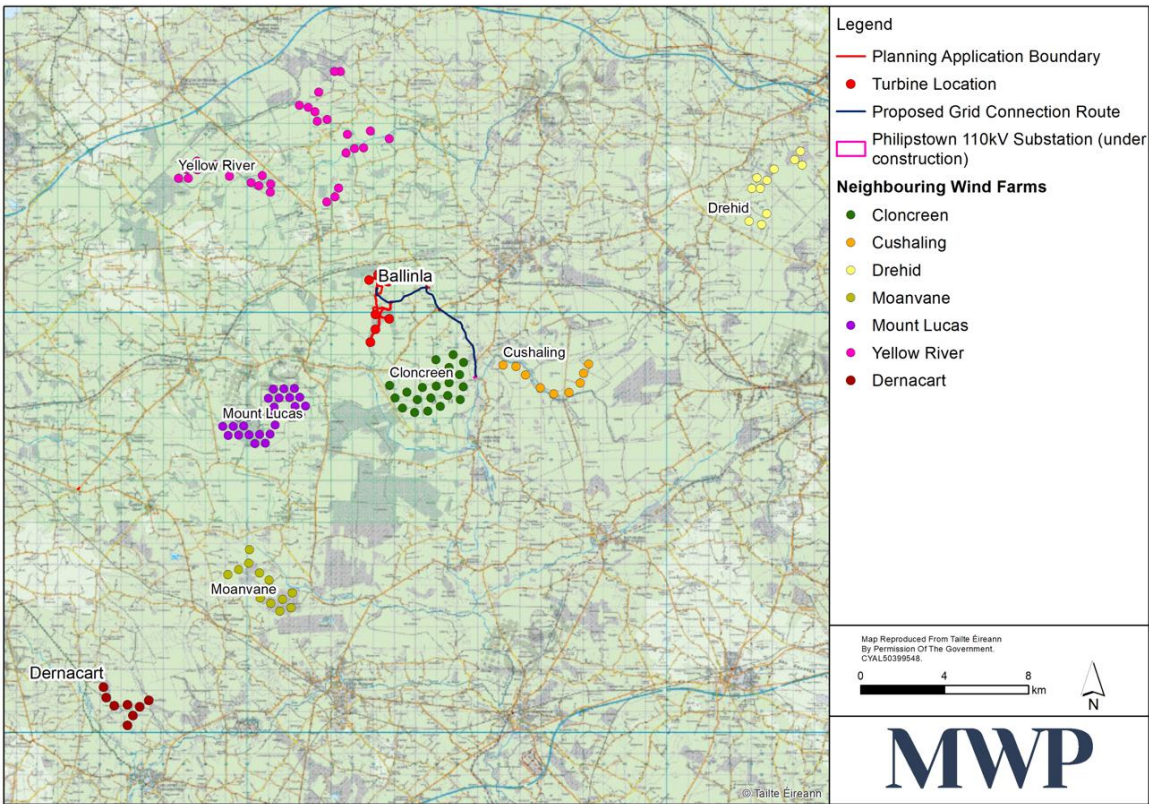
Proposed Wind Farm Layout



Surrounding Water Courses



Proposed TDR from Primary Network (M6) to Proposed Wind Farm



Wind Farms within 25km of Proposed Development

Appendix 3

CEMP



Construction Environmental Management Plan (CEMP)

Ballinla Wind Farm

Ballinla Wind Farm Ltd.

September 2025

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1. Introduction

This Construction Environmental Management Plan (CEMP) outlines the scope of construction works, construction methodologies and environmental management measures which will be implemented and followed for the Proposed Development in order to ensure that the project is constructed in accordance with best practice and with the minimum impact on the surrounding environment. For the purposes of the CEMP, the Proposed Development comprises the construction of seven wind turbines, an onsite 110 kilovolt (kV) substation and all ancillary works in County Offaly (the Proposed Wind Farm), in addition to works along the turbine delivery route (TDR) (the Proposed TDR). This CEMP also considers the associated grid connection (the Proposed Grid Connection), which will be subject to a separate planning application but included as it forms part of the overall project.

1.1 Report Purpose and Objectives

All construction projects require the preparation of a Site-Specific CEMP in order to ensure that the project is constructed in accordance with Best Practice, with the minimum impact on the surrounding environment.

The purpose of a CEMP is to outline how the Contractor(s) will implement a site construction management system to meet the specified requirements which include contractual, regulatory and statutory requirements, environmental mitigation measures and planning conditions.

In essence this CEMP is to provide the Client and the Main Project Contractor with a practical guide to ensure compliance by all parties with Planning and Environmental requirements.

The CEMP achieves this by providing the environmental management framework to be adhered to during the pre-construction and construction phases of the proposed development. It outlines the work practices, construction management procedures, management responsibilities, mitigation measures and monitoring proposals that are required to be adhered to in order to construct the works in an appropriate manner.

All site personnel will be required to be familiar with the plan's requirements as related to their role on site. There will be a requirement on the Appointed Contractor that details are updated with progress, including the roles and responsibilities of those appointed on the site for the construction of the Proposed Development.

This CEMP is intended to be a live document whereby different stages will be completed and submitted as the development progresses

1.2 Scope

The CEMP defines the approach to environmental management at the site during the construction phase relating to all construction activities. Compliance with the CEMP, the procedures, work practices and controls will be mandatory and will be adhered to by all personnel and contractors employed on the construction phase of the Proposed Development. This CEMP seeks to:

- Promote best environmental onsite practices for the duration of the construction phase.
- Comply with any planning conditions that may apply.

The CEMP is considered a 'live' document, and as such, will be reviewed on a regular basis. Updates to the CEMP may be necessary due to any changes in environmental management practices and/or contractors. The

procedures agreed in this CEMP will be audited regularly throughout the construction phase to ensure compliance.

2. Overview of Project

The Proposed Development for which planning permission is sought consists of the following:

- Seven Wind Turbine Generators (WTGs) (blade tip height 185m, refer to **Table 2-1** for dimensions of each turbine).
- Seven WTG foundations and hardstand areas.
- One electrical substation (110kV) including independent power producer (IPP) substation and wind farm operations compound with associated ancillary buildings, security fencing and all associated works.
- One LiDAR station based on the ground.
- Two new site entrances from the L5010.
- New and upgraded internal site access tracks.
- All associated underground electrical and communications cabling connecting the proposed turbines to the proposed onsite substation.
- The TDR including temporary works on sections of the public road network and private lands along the turbine delivery route on the L-5006 and the junction of the R-402 and R-420.
- One temporary construction site compound and additional mobile welfare unit.
- One spoil deposition area.
- Landscaping.
- Associated surface water management systems.

The project considered in this CEMP includes for an underground grid connection cabling, connecting the onsite substation to the national electricity grid via the Philipstown 110kV Substation located in the townland of Ballykilleen, Co. Offaly. The cabling will be located within the public road corridor or existing tracks for its entire length. The total length of the Proposed Grid Connection Route is approximately 8km, the full length of the Proposed Grid Connection Route is located within Co. Offaly. To ensure clarity, the Proposed Grid Connection Route will be the subject of a separate future planning application.

All elements of the Proposed Development listed above, have been considered as part of this CEMP.

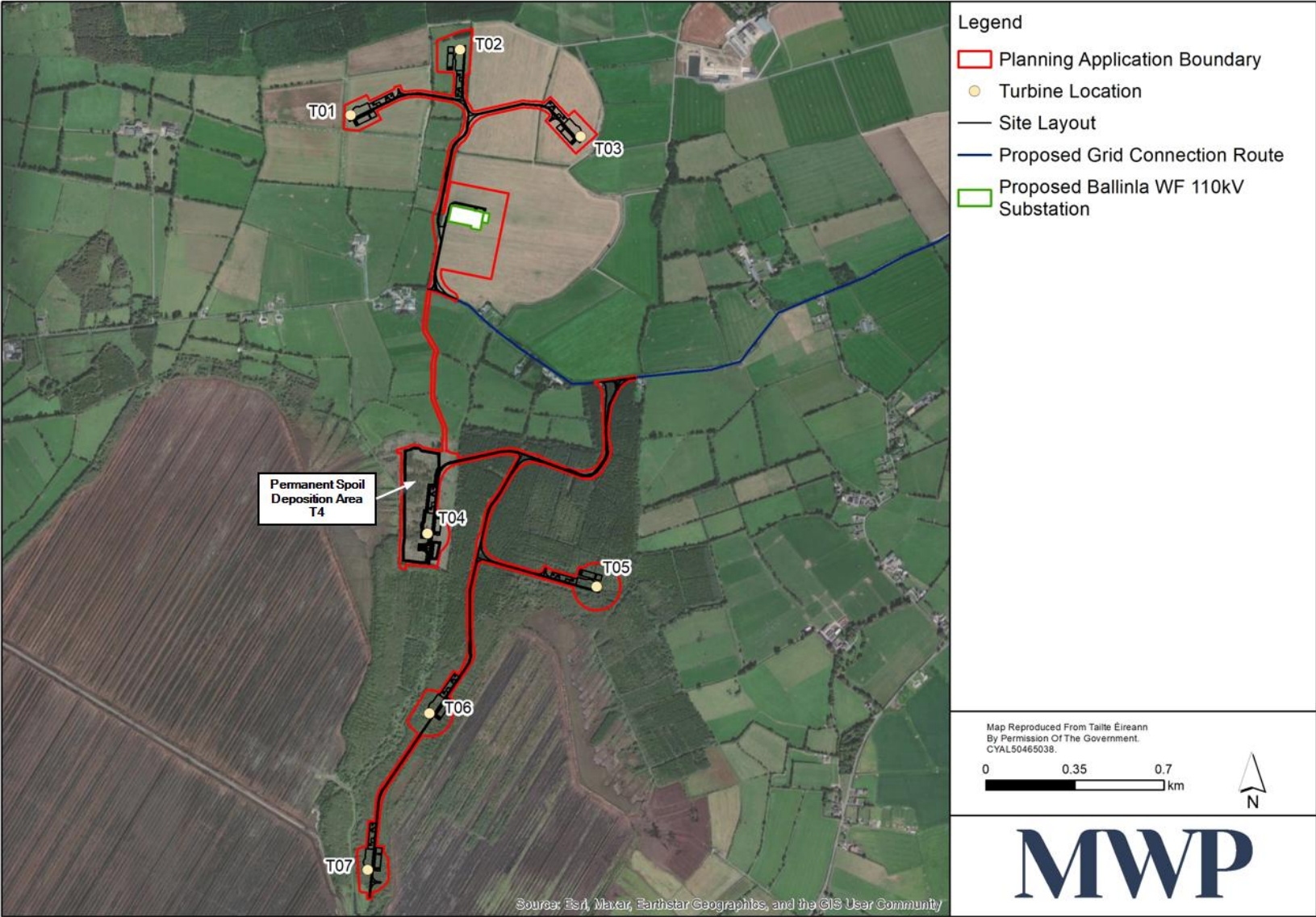


Figure 2-1: Proposed Wind Farm and Substation Layout

Table 2-1: Proposed Turbine Dimensions and Co-ordinates

Turbine Ref. No.	Hub Height	Blade Length	Turbine tip height (m)	Grid Co-ordinates (ITM)	
T1	104	79.35	185	655751 (X)	731543 (Y)
T2	104	79.35	185	656181 (X)	731802 (Y)
T3	104	79.35	185	656655 (X)	731460 (Y)
T4	104	79.35	185	656053 (X)	729897 (Y)
T5	104	79.35	185	656718 (X)	729689 (Y)
T6	104	79.35	185	656060 (X)	729191 (Y)
T7	104	79.35	185	655818 (X)	728575 (Y)

2.1 Turbine Delivery Route and Grid Connection

The Proposed TDR is detailed in the **Turbine Delivery Route Assessment, Appendix 2-2** of the EIAR. Minor works are required along the route with three TDR nodes red lined for works (see **Figure 2-2**). The TDR will run on public roads and all works in relation to it are temporary in nature.

The Proposed Grid Connection will run from the proposed 110kV substation to the existing Philipstown 110kV substation (see **Figure 2-3**). The associated underground cabling will travel along the access tracks for approximately 500m to the L5010. On the L5010 the cable will travel east for approximately 2km to the L5006. On the L5006 the cable route turns south on the L5006 for approximately 5km before joining the R401 south for approximately 1km where it will link into the newly constructed Philipstown 110kV substation. The full length of the Proposed grid Connection route is approximately 8km.

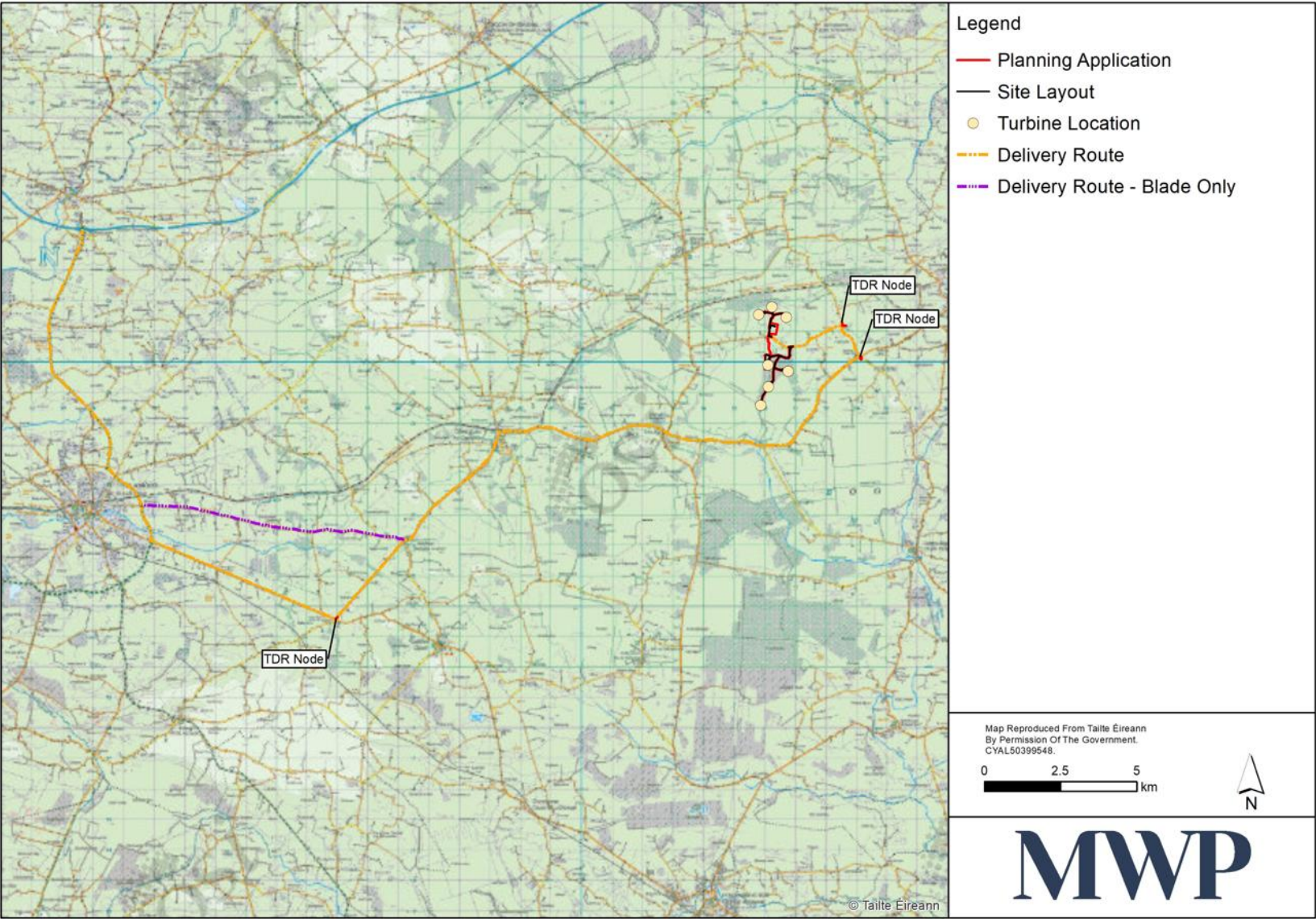


Figure 2-2: Turbine Delivery Route



3. Construction Works

3.1 Construction Schedule

It is envisaged that construction of the Proposed Development will commence in 2027 with an expected 18-month construction period. The start date is dependent on planning being granted, receipt of a grid connection offer from EirGrid, funding and all other ancillary permits being in place.

The Proposed Development construction works will be phased as outlined in **Table 3-1**. A number of these phases will however run concurrently including:

- As the internal site access tracks are constructed up to each turbine, hardstanding areas for the crane, turbine foundations and building foundations will be prepared.
- Once the tracks are completed, the trenching and laying of underground cables will begin.
- Construction of the site sub-station and control houses will commence so that they will be ready to export power as turbines are commissioned.

Table 3-1: Preliminary Indicative Construction Programme

Phase	Activity	Duration
Phase 1	Clear felling (to be complete ahead of construction site mobilisation)	2 months (prior to construction)
Phase 2	Prepare site, pre-construction activities, site entrance, temporary compound	1 month
Phase 3	Access track construction + Drainage plan implementation	3 months
Phase 4	Hard standing construction for turbines	2 months
Phase 5	Turbine Foundation construction	4 months
Phase 6	Trenching and ducting (underground electrical collection system)	2 months
Phase 7	Substation construction	4 months
Phase 8	Turbine delivery	3 months
Phase 9	Turbine erection	4 months
Phase 10	Wind Farm Commissioning	4 months (approx.)

3.2 Working Hours and Construction Personnel

Typically, construction will occur within the hours 7.00am – 7.00pm, Monday to Friday and 7.00am to 4.00pm on Saturdays, which will be confirmed with the Local Authority. Due to the requirement for the concrete pours to be continuous, the working day may extend outside normal working hours in order to limit the traffic impact on other road users, particularly peak period school and work commuter traffic. Such activities are limited to the day of turbine foundation concrete pours, which are normally complete in a single day per turbine. Turbine and crane erections may also occasionally occur outside of these times in order to take advantage of low wind periods. Working hours will be confirmed at the outset of the project and any changes in hours will be agreed with the Local Authority.

A permit for moving abnormal loads will be sought from An Garda Síochána for the delivery of oversized wind turbine components (i.e. blades, nacelles and towers).

There shall be no work on Sunday or bank holidays unless preapproved with the Local Authority.

During the construction phase, the number of onsite construction personnel will vary for each phase of the development. Overall, it is envisaged that the wind farm and substation works of the proposed development would generate employment for up to 60 persons during the construction phase to include site contractors, onsite vehicle and plant operators, engineers, materials delivery personnel, environmental and health and safety personnel.

It is expected that the civil works for the grid connection route will require at least 10 personnel to complete the works. The electrical works will require less heavy machinery but more labour personnel, with typically 25 personnel to complete the works.

4. Construction Methodology

Key elements of the civil works and activities associated with the construction phase of the Proposed Development are as follows:

4.1 Pre-Construction Surveys

Any detailed ground investigations, environmental surveys and archaeological testing required to support the construction process will be carried out and finalised. These may include:

- Pre-construction ornithology surveys.
- Pre-construction monitoring of terrestrial mammals conducted to determine whether their use of the site has altered.
- Baseline water quality assessment.
- Pre-development archaeological testing at the site.

4.2 Enabling Works

Prior to construction commencing, on site demarcation of the construction site boundary will be undertaken to prevent equipment tracking outside of the planning boundary.

To prepare the site for the construction of the internal tracks, turbines and hardstand areas, clearance of small areas of scrub and hedgerows is required. The temporary compound will also be set-up at this stage.

4.3 Temporary Site Construction Compound

One temporary construction compound will be set up upon commencement of the construction phase. The location of the temporary compound is shown in **Figure 4-1**. See planning application **Drawing No. 23882-MWP-00-00-DR-C-5417** for details.

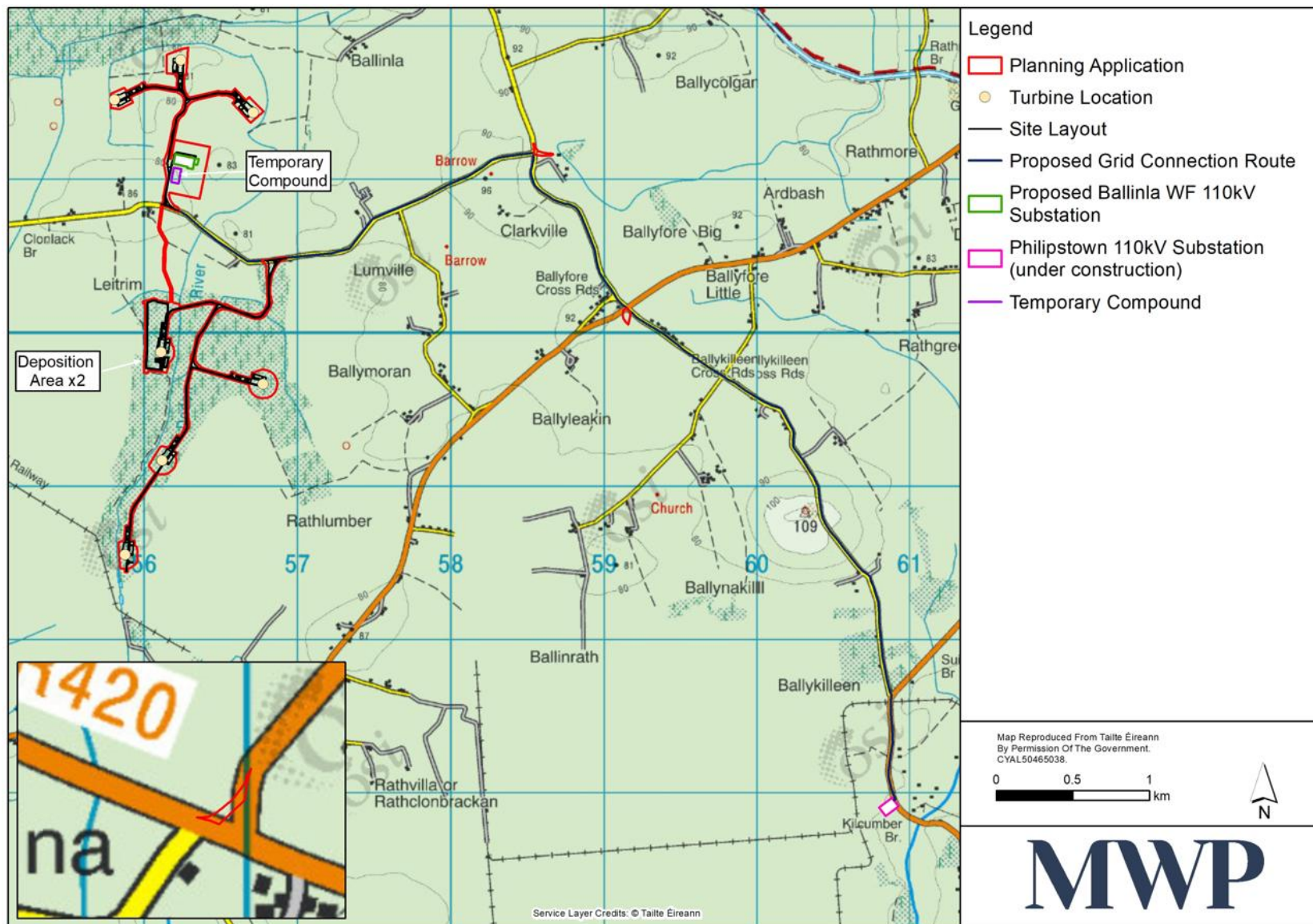
The compound will be used as a secure storage area for construction materials and will also contain temporary site cabins to provide welfare facilities for site personnel. Facilities will include office space, meeting rooms, canteen area, and mobile sanitary facilities. There will be areas designated for parking as well as construction waste within this compound. The proposed development will include an enclosed wastewater management system at the temporary compound capable of handling the wastewater demand during the construction phase. A holding tank is proposed at the compound for wastewater management. The holding tank will be emptied by a licensed permitted contractor only. Upon completion of the project the compound will be decommissioned by backfilling the area with the material arising during excavation and landscaping with topsoil.

The exposed surface will be levelled out by cutting and filling and will be overlain with a layer of crushed stone from a local quarry. The finished surface will be formed with a layer of Unbound Granular Mixture A (UGMA) (formerly clause 804) or similar aggregate imported from a local quarry. The site compound will be graded and compacted out before the welfare container facilities are installed.

The compound will be in place for the duration of the construction phase and will be removed once commissioning is complete.

Areas within the compound will be constructed as access tracks and used as vehicle hardstanding during deliveries and for parking.

- A bunded containment area will be provided within the compound for the storage of lubricants, oils, and site generators etc.
- The compound will be fenced and secured with locked gates.
- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used on site for toilet facilities. This will be maintained by the service contractor on a regular basis and will be removed from the site on completion of the construction phase.
- Upon completion of the construction phase, the compound will be decommissioned by backfilling the area with the material arising during excavation, landscaping with topsoil as required.



4.4 Site Entrances

Primary access to the Proposed Development will be provided from the local public road linkage (L5010) between the L-5006 in the east and the R400 to the west (refer to Figure 4-2). There will be two site entrances, one each to facilitate the northern and southern sections of the Proposed Wind Farm.

Entrance Point 1 will be created on the L-5010 local road and will serve the southern portion of the Proposed Wind Farm and internal tracks to T4, T5, T6 and T7. Entrance Point 2 on the L-5010 will serve the northern portion of the Proposed Wind Farm and internal tracks to T1, T2, T3 and the substation. These site access points will facilitate turbine deliveries, construction materials, aggregates, operations and maintenance vehicles. These will be permanent access points, however they will be scaled back, landscaped, fenced and gated as the Proposed Development enters the operational phase.

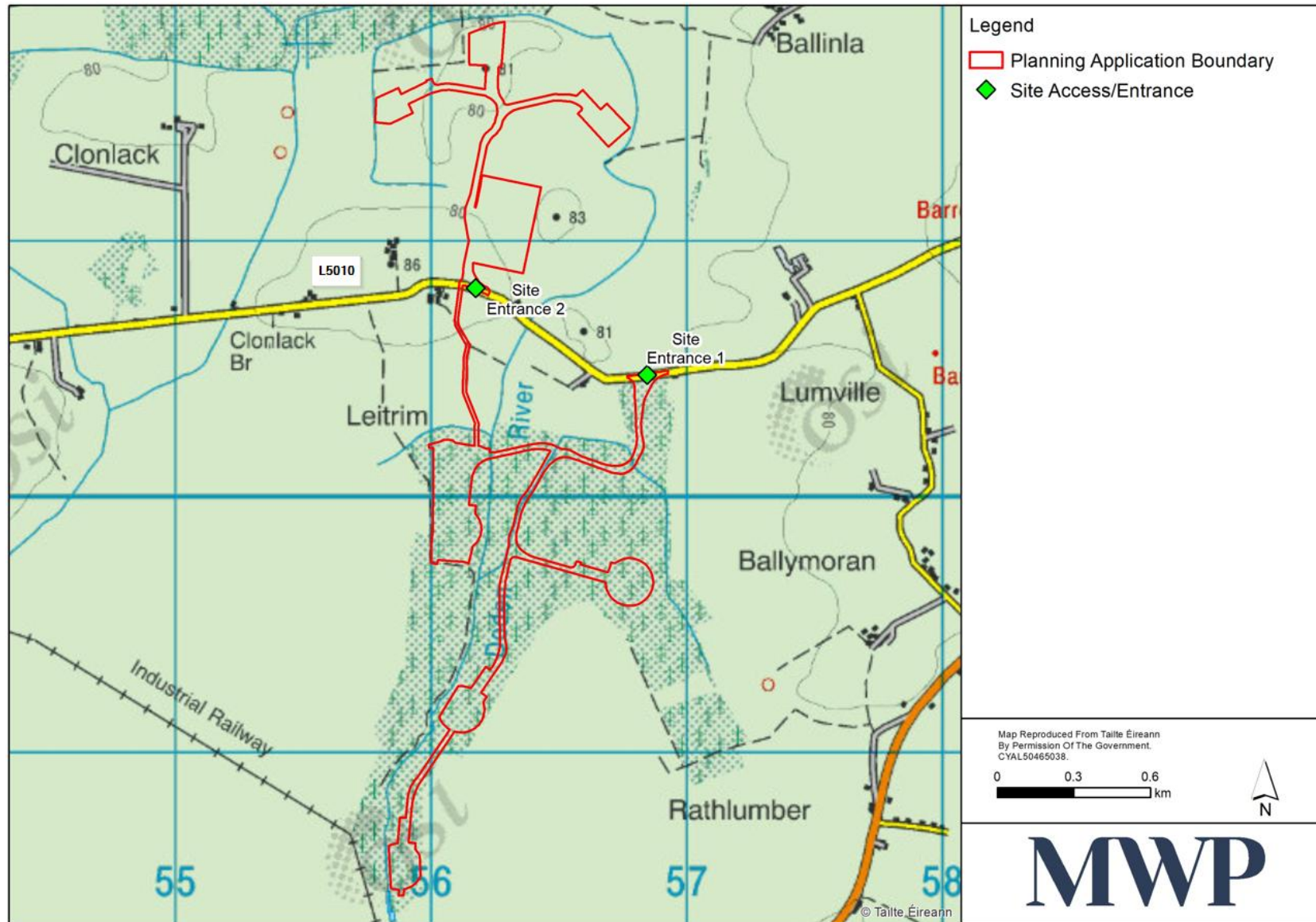


Figure 4-2: Site Access Points and Proposed Development Area Layout

4.5 Internal Site Tracks

Internal site access tracks are required to interconnect elements of the site and allow access to all wind turbines and wind farm infrastructure. Existing tracks will be upgraded, and new tracks will be constructed to access each of the turbines and substation compound.

The routing of internal access tracks is shown in **Figure 2-1**. These access tracks will be constructed using excavated and floating track techniques depending on the ground conditions.

See planning application **Drawing No. 23882-MWP-00-00-DR-C-5007** to **Drawing No. 23882-MWP-00-00-DR-C-5018** for details. The finished surface of the internal access tracks will be raised above the surrounding ground level and cambered to allow surface water to runoff the track surface.

4.6 Site Drainage System and Water Quality Management

During the construction phase of the project, there is potential for sedimented surface waste runoff from the construction works areas to contaminate downstream watercourses, without implementation of appropriate mitigation measures. Fundamental to any construction project, is the need to keep clean water (i.e. runoff from adjacent ground upslope of the permitted development footprint) clean and manage all other runoff and water from construction in an appropriate manner.

A site-specific drainage system has been designed taking account of the following:

- Knowledge of the ground and hydrological conditions at the site.
- Previous construction experience of wind farm developments in similar environments.
- Previous experience of environmental constraints and issues from construction of wind farms in similar environmental conditions.
- Technical guidance and best management practice manuals.

The system is designed to ensure that it will largely mimic the existing drainage regime across the site, will not deteriorate water quality and will safeguard catchment water quality status from wind-farm-related sediment runoff. The following are the key elements of the proposed drainage system:

- Clean water upgradient from works, which would otherwise flow into the site infrastructure areas, will be collected in cut-off drains and diverted away from or piped unimpeded through site infrastructure. This reduces the risk of clean water mixing with dirty water runoff from the development and also reduces the volume of dirty water to be treated.
- Access tracks will be cambered to ensure dirty water flows towards to dirty water drain.
- Runoff collected in dirty water drains will be routed through settlement ponds prior to travelling through overland flow/percolation to existing agricultural field drains or to existing watercourses.
- Stone filter beds will be installed at the outfall of the settlement ponds.
- (2) rows of Terrastop silt fencing will be installed along the top banks of watercourses and existing agricultural field drains where infrastructure will cross or run adjacent to a watercourses or existing agricultural field drains. The silt fencing will slow overland flows and provide additional filtration of suspended solids prior to discharge entering watercourses.
- Areas between structures within the onsite substation compound will be constructed of permeable crushed stone. A footpath will be installed around the substation building. This footpath will be graded to direct surface water away from the building towards a land drain installed within the compound stone and discharging to a bioretention basin and overflowing overland to existing land drainage.

- All stormwater runoff from electrical infrastructure bunds within the substation compound where the risk of an oil leak or spill may be present, will be treated using Class 1 full retention interceptor manufactured in accordance with IS EN 858 parts 1 and 2 and a BundGuard pump and sump system (or similar).
- All bunds will be fitted with alarmed sensors to detect oil. High water levels in the sump will activate the pump and the water level will begin to drop as the sump is emptied. When the oil layer is detected by the units sensors, the pump will stop and no water will discharge. When the next rainfall event occurs, this process is repeated with the oil layer always remaining in the bund.
- To ensure effective drainage from the permanent internal access track network and substation compound, the drainage measures installed for the construction phase will remain in place for the operational life of the wind farm.

The drainage layout is presented in **Planning Drawing No. 23882-MWP-00-00-DR-C-5019** with associated drainage layout details presented in **Planning Drawing No. 23882-MWP-00-00-DR-C-5020** to **Planning Drawing No. 23882-MWP-00-00-DR-C-5031**.

Figure 4-3 shows a well-constructed and maintained tiered settlement pond. The design was developed in conjunction with Inland Fisheries Ireland (IFI) personnel and local authority engineers. This example is located in an upland environment with significant ground surface slope and operates efficiently provided that it is well maintained.



Figure 4-3: Typical Three-tiered Settlement Pond with Stone Filter

4.6.1 Drainage/Stream Channel Crossings

Watercourses Within the Wind Farm Boundary

On the proposed site, four watercourse crossings will be required on EPA registered streams. The water crossings will consist of one clear span bridge and three culverts.

Land Drains within the Wind Farm Boundary

In the northern section of the proposed development, there are small field drains within the hedge lines of the agricultural fields. There will be approximately nine field drains to be crossed in this section of the wind farm. Bottomless culverts will be used in the northern section of the site.

In the southern section, there are numerous minor forestry drains all draining east to west within the forestry and the peatlands. Four land drains have been noted in site walkovers. They will be crossed using culverts.

Watercourses within the Grid Connection Route

The Proposed Grid Connection route is 8km long on local roads. One EPA registered watercourse crossing is required along the Proposed Grid Connection, the Leitrim Stream (EPA River Water Body Code: IE_SE_14E010200). 18 land drains have been identified along the route.

4.6.2 Water Quality Management Systems

Sediment can cause pollution during the construction phase of a civil engineering project due to the erosion of exposed soil by surface water runoff. The water quality management system has been prepared in order to control erosion and prevent sediment runoff during the construction phase of the proposed development. The implementation of sediment and erosion control measures is essential in preventing sediment pollution. The system was designed having regard to:

- Knowledge of the site's environmental conditions.
- Previous experience of environmental constraints and issues from construction of wind farms in similar environmental conditions.
- Technical guidance and best management practice manuals.

4.6.3 Water Quality Monitoring

4.6.3.1 Pre-Construction Baseline Monitoring

Pre-baseline construction monitoring will be carried out at the following proposed locations which drain the Proposed Development (see **Table 4-1** and **Figure 4-4**).

Surface water monitoring for the baseline is to include all parameters outlined below for the construction stage monitoring. The three locations for recommended for monitoring are sites 5, 6 and 10. Water quality field testing and laboratory analysis will be undertaken at these locations prior to commencement of felling and construction at the site. The monitoring programme will be based on the planning stage programme as outlined in the EIAR and presented herein.

Table 4-1: Baseline Monitoring Locations

Hydrometric Area	Sub-basin	Watercourse	River Code	Segment	Site	x	y
		Leitrim	14_1844	5		656648	731817
Barrow	ESKER STREAM_020	Leitrim	14_1844	6		656330	730714
		Leitrim	14_248	10		655774	728475

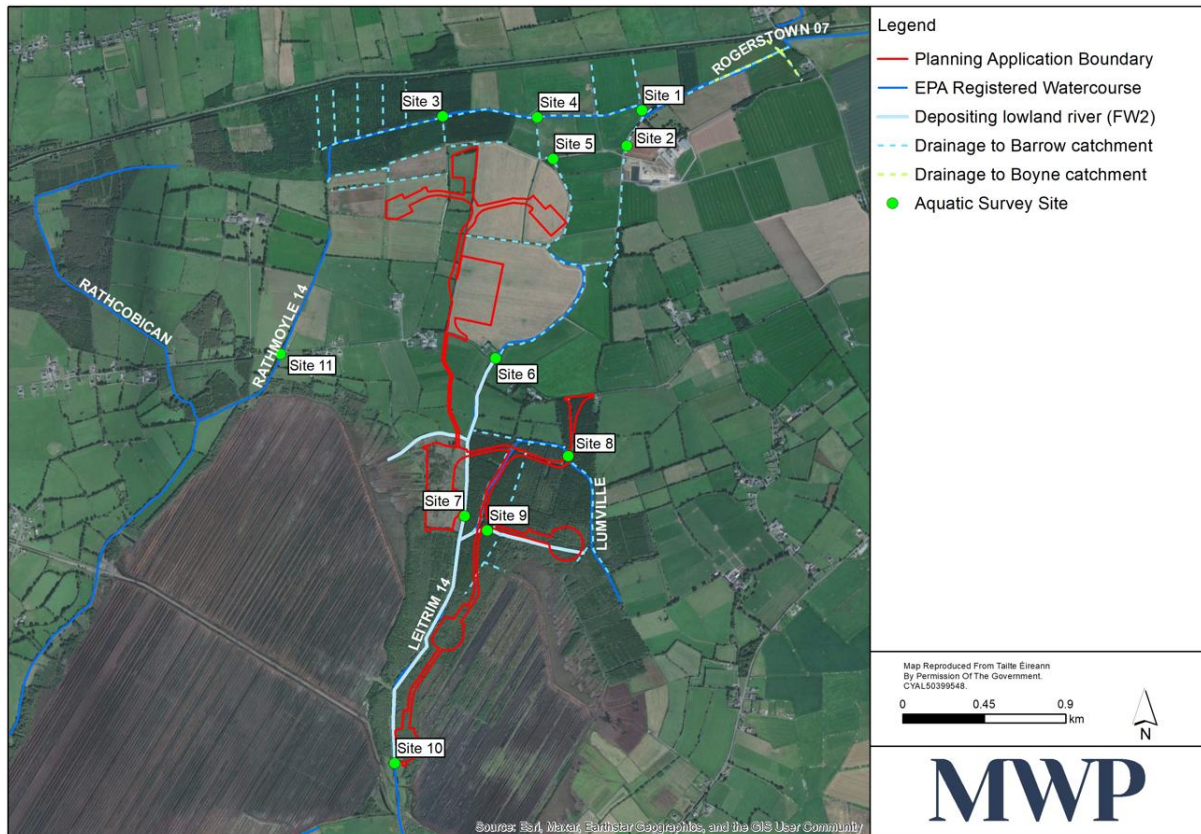


Figure 4-4 Water Quality Monitoring Locations

4.6.3.2 Construction Phase Monitoring

Continuous Field Monitoring

During the construction phase of the project, a surface water monitoring schedule, finalised prior to construction, will be followed. In summary, it is recommended that weekly field monitoring of surface water quality chemistry will be carried out at identified surface water quality monitoring locations 5, 6 and 10 in **Figure 4-4**, or others as required.

The following parameters will be measured:

- pH (field measured).
- Electrical Conductivity (field measured).
- Temperature (field measured).
- Dissolved Oxygen (field measured).
- Total Dissolved Solids (TDS).
- Turbidity (field measured).

Monthly Laboratory Analysis

The analytical determinants of the monitoring programme (including limits of detection and frequency of analysis) will be as per S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations

and European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. The likely suite of determinants will include:

- pH.
- Total Petroleum Hydrocarbons (TPH).
- Temperature.
- Total Phosphorus.
- Chloride.
- Nitrate.
- Nitrite.
- Total Nitrogen.
- Orthophosphate.
- Ammonia N.
- Biochemical Oxygen Demand.
- Total Suspended Solids.

Visual Monitoring

Periodic visual observations at each of the monitoring points will be recorded with specific reference to flow, stream substrate and water colour. Photos will be taken to support visual observation, and inspection sheets including visual observation results and photographic records will be kept on site.

Visual observations will also be completed after major rainfall events along with photographs which will be collected and assessed by the ECoW.

The elements which will be included in the visual checklist are as follows:

- Appropriate periodic visual inspection of all watercourses which drain the proposed development by the ECoW or a suitably qualified and competent person delegated by the ECoW.
- All elements of drainage system will be monitored including settlement ponds, check dams, interceptor drains etc. Corrective action will be carried out if there is a visual indication of discoloration, oily sheen, odour or litter.
- Event based visual inspections by the ECoW as follows:
 - Following a high intensity localised rainfall event (10mm/hr).
 - Heavy rainfall within a day (25mm in a 24 hour period).
 - Higher than monthly rainfall within a week period.
- A record of all visual inspections will be included in the Construction Environmental Management Plan (CEMP) and maintained site.

4.7 Traffic Management

A detailed Traffic Management Plan (TMP) has been prepared and is included in **Appendix 15** of the **EIAR**. The TMP will be updated at the construction stage (or the update commenced during planning compliance stage) to ensure controls are in place for all users of the site. It will be necessary to engage with the Roads and Transportation section of Offaly County Council and with An Garda Síochána and to establish traffic volumes and local road usage at the time.

The purpose of developing and implementing an agreed TMP for the construction phase works is to minimise the impact of the works on local residences and users of the public road networks.

4.8 Spoil Management and Material Volumes

It has been calculated that there will be approximately 84,700m³ of material excavated during the construction of the Proposed Development. It is intended that all soils and subsoils generated from excavation works will be retained on site and reused in bunding, landscaping and localised earthworks. Berms will be formed along sections of access tracks and hardstands that will act as edge protection and drainage measures. Drainage and siltation control measures will be put in place in all material stockpile areas. This will include a dedicated drainage network, temporary silt fences and settlement ponds designed to cater for the size of each storage area.

Excess spoil material will be permanently stored on site in the designated spoil deposition area. The proposed location for the spoil deposition area is shown on **Planning Drawing No. 23882-MWP-00-00-DR-C-5012**.

The calculated volume of material requirements is summarised in **Table 4-2**.

Table 4-2: Spoil Excavation and Construction Material Volumes

Item	Unit	Quantity
Imported stone for turbine bases	m3	10738
Imported stone for turbine hardstand	m3	28816
Imported stone for access tracks	m3	4654
Imported stone for substation area	m3	16843
Imported stone for temporary compound	m3	3781
Imported stone for independent power producer	m3	19899
Imported stone for external cable route	m3	2943
Imported stone for internal cable route	m3	121
Total volume of imported aggregate required	m3	87795
Concrete for turbine Bases	m3	8482
Concrete for substation	m3	73
Concrete for lidar unit	m3	3
Concrete for independent power producer	m3	327
Concrete for external cable route	m3	2864
Concrete for internal cable route	m3	1852
Total volume concrete required	m3	13601
Reinforced steel for turbine bases	tonnes	1272
Reinforced steel for substation	tonnes	9
Reinforced steel for independent power producer	tonnes	41
Reinforced steel for lidar unit	tonnes	0
Total volume of imported steel reinforcement required	tonnes	1323

* This material will be reused on site as preference in trackside berms etc. It is however included in the table above as material to be removed from site as a precautionary measure.

4.9 Wind Turbines

4.9.1 Wind Turbine Locations

Turbines have been located to minimise the volume of excavated spoil and to achieve as close as possible to a balance of cut and fill of the underlying strata at each turbine location. This was achieved by orientating the turbine base and crane hardstanding area with its long axis parallel to the ground contours as much as possible while taking account of access criteria for delivery of turbine components. **Table 4-3** gives the location of each of the proposed turbines.

Table 4-3: Turbine Locations

Turbine Ref. No.	Hub Height	Blade Length	Turbine tip height (m)	Grid Co-ordinates (ITM)	
T1	104	79.35	185	655751 (X)	731543 (Y)
T2	104	79.35	185	656181 (X)	731802 (Y)
T3	104	79.35	185	656655 (X)	731460 (Y)
T4	104	79.35	185	656053 (X)	729897 (Y)
T5	104	79.35	185	656718 (X)	729689 (Y)
T6	104	79.35	185	656060 (X)	729191 (Y)
T7	104	79.35	185	655818 (X)	728575 (Y)

4.9.2 Turbine Crane Hardstands

The layout of the crane hardstand is designed to accommodate the delivery of the turbine components prior to their erection and to support the cranes during erection. Hardstands are also used for maintenance during the operation of the turbine. The hardstands will be rectangular in shape with additional hardstand set down area to lay the turbine blades across once delivered. The area of a single hardstand is approximately 80m long by 30m wide. Refer to **Planning Drawing No. 23882-MWP-00-00-DR-C-5403** for further details. Due to the substantial loads exerted by the main lifting crane's outriggers during turbine erection, the hardstands will be constructed using excavation techniques across the full footprint of the turbine base and hardstand area to ensure stability and load-bearing capacity.

The proposed works will be restricted to the turbine locations and will comprise the followings:

- Each crane hardstand will be formed on competent subgrade of the underlying subsoil/rock which will comprise of stone aggregate (obtained from either the onsite borrow pit, excavated works, or imported from the nearby quarry) laid on a geotextile filter membrane.
- Any existing unsuitable soil found within the footprint of the turbine hardstand will be excavated out during formation works. The excavation works will be carried out using hydraulic excavators where surplus subsoil material will be transported to the onsite deposition areas via articulated dumper.
- The stone aggregate for the turbine hardstands will be compacted in 250mm layers and will vary from approximately 300mm to 900mm deep depending on the gradient of the underlying subgrade.
- Temporary set down areas will be formed to facilitate the storage of the turbine components at each crane hardstand (e.g., the turbine blades, the turbine towers, and nacelle). Each temporary set down area will be constructed using compacted stone aggregate which will be fully removed and reinstated after all turbines have been erected.

- Plate bearing test results will be undertaken on the finished hardstand surface to check if ground bearing strengths are to the wind supplier's specifications. Once complete the assembly cranes will be set up on the hardstand and erect the wind turbine into place.
- Where drop offs greater than 1m in height occur alongside hardstand edges. Physical edge protection will be constructed to reduce the risk of vehicles overturning or persons falling.

4.9.3 Turbine Bases

Wind turbines will have a reinforced concrete base pad foundation with a central pedestal above the base, that will in turn support the wind turbine tower. Each turbine base will bear onto rock or other such suitable bearing stratum and will be constructed utilising a spread foundation, which is wide and shallow. A typical foundation will be approximately 28m in diameter and will generally be installed to a depth of approximately 3.5m below ground level. Approximately 1200m³ of concrete and 180 tonnes of steel will be used in the construction of each turbine base. Refer to **Planning Drawing 23882-MWP-00-00-DR-C-5402** for further details.

The proposed works will be restricted to the turbine locations and will comprise the following:

- The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter.
- Any existing subsoil found within the footprint of the turbine base will be excavated out during formation works at the adjacent crane hardstand area. The excavation works will be carried out using hydraulic excavators where surplus subsoil material will be transported to the onsite deposition areas via articulated dumper trucks or tractor and trailer.
- Standing water in turbine base excavations is likely to contain an increased concentration of suspended solids. Dewatering of turbine base excavations can result in significant flow rates to the drainage and settlement system if high-capacity pumps are used. To avoid the need for pumping, it is proposed to provide drainage channels from the excavations to prevent a build-up of water. Where this is not feasible, temporary storage will be provided within the excavations and dewatering carried out at a flow rate that is within the capacity of the settlement ponds.
- The excavated surface will be levelled and adequate drainage measures will be put in place along with suitable set back areas to facilitate placing of stone and ultimately the erection of shuttering for the turbine base.
- If poor ground conditions are encountered during excavation and a significant depth to sub-formation is required, a piled foundation may be considered. A piled foundation requires the use of a piling machine equipped with an auger drill to rotary bore a number of holes around the area of the turbine base to the sub-formation depth determined at construction stage. Once all the holes have been bored, reinforcement steel is inserted into each with concrete poured afterwards. Piling if required, will be limited and localised.
- Suitable stone aggregate will be used to form a solid level working foundation surface. The stone will be rolled and compacted to a suitable formation level.
- Shutters and steel reinforcement will then be put in place and the foundation of the turbine will be prepared for pouring of concrete.
- A layer of concrete blinding approximately 100mm thick will be laid directly on top of the newly exposed formation, tamped and finished with a screed board to leave a flat level surface. The concrete will be protected from rainfall during curing and all surface water runoff from the curing concrete will be prevented from entering surface water drainage directly.
- High tensile steel reinforcement will be fixed in accordance with the design drawings and schedules. The foundation anchorage system will be installed, levelled and secured to the blinding using steel box section stools.

- Ductwork will be installed as required, and formwork erected around the steel cage and propped from the backside as required.
- The foundation anchorage system will be checked both for level and line prior to the concrete being installed in the base. These checks will be passed to the turbine supplier for their approval.
- Ready-mix concrete will be delivered to each turbine base by a fleet of ready-mix concrete trucks via the internal access tracks. Concrete will be placed into each base by means of a concrete pump where vibrating pokers will be used to ensure that full and proper compaction of the concrete around the reinforcement in the turbine base has been made. Upon completion of the concreting works the foundation base will be covered and allowed to cure.
- Steel shutters will be used to pour the circular chimney section.
- Following curing, the shuttering around the turbine base will be struck and removed.
- Earth wires will be placed around the base.,
- The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation and landscaped using the vegetated soil set aside during the excavation. A gravel footpath will be formed from the access track to the turbine door and around the turbine for maintenance.

4.10 Tree Felling

Felling of conifer forestry is required within and around wind farm infrastructures to accommodate the construction of foundations, hardstands, substation, grid connection and access tracks as well as to facilitate assembly of turbines and bat buffers. It is proposed to have felling distances of between 83m and 91m around specific turbines. The proposed felled areas are shown on **Figures 4-5 and 4-6**.

All tree felling will be undertaken in accordance with a tree felling licence, using good working practices as outlined by the Forest Service in their *"Standards for Felling & Reforestation 2019"*. All conditions associated with a felling licence will be complied with.



Figure 4-5: Areas to be Felled in Southern Area (in amber) - Excerpt from 23882-MWP-00-00-DR-C-5034

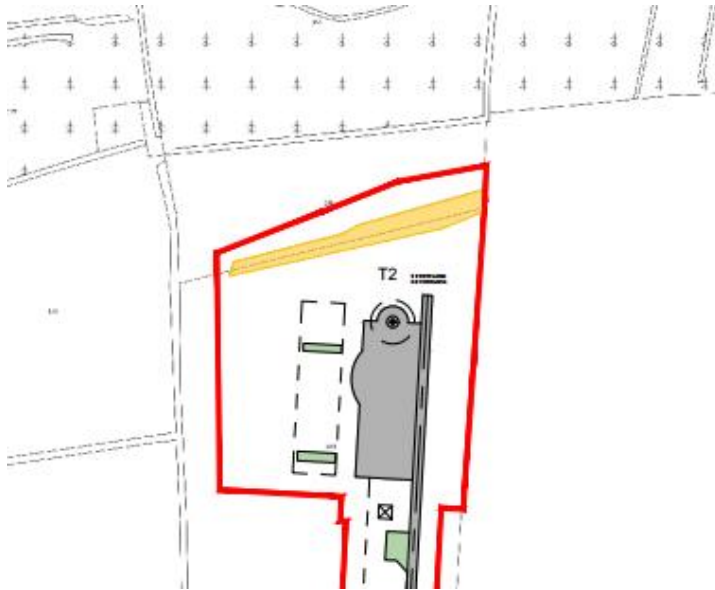


Figure 4-6: Areas to be Felled in Northern Area (in amber) - Excerpt from 23882-MWP-00-00-DR-C-5034

4.11 Electrical Transmission/Distribution

4.11.1 Distribution Network

Each individual turbine will generate electricity at a nominal voltage and will have its own internal transformer to step-up to an onsite distribution network voltage. The transformer and associated switchgear will be located within the turbine tower. A network of underground cabling servicing each turbine with electrical power and signal transmission will be installed along internal tracks to collect the electricity from each turbine and connect them to the onsite substation. Cabling will be installed in PVC ducting laid in trenches adjacent to the tracks edge (as illustrated on **Drawings 23882-MWP-00-00-DR-C-5020 to 5028**). Access to the cable ducting is provided by intermittent chambers and pull pits at defined locations adjacent to the access track infrastructure.

4.11.2 Wind Farm 110kV Substation

The proposed 110kV wind farm substation compound will occupy an area of approximately 10,500m² and will comprise an outdoor electrical yard and two single storey buildings (one for EirGrid and one for the wind farm operator). The substation will connect via underground cable circuits to accommodate a grid connection. The proposed 110kV substation will be made up of 1 No. Control Building, 1 No. IPP MV Switch room, Transformer compound and Busbar compound.

The control building works will consist of foundation works, block work, roofing, low voltage electrical fit out, cladding and building finishing works. The transformer, gantry and structural steelwork will be installed in the transformer compound. Two cable sealing ends will be installed to incorporate the radial underground circuits in and out of the station. The busbar compound structural steelwork will be erected, with lightning masts also installed. Substation electrical equipment will be installed once the control building and compound is complete. Fencing will be erected around the compound for security/protection. Permanent access tracks will also be installed to allow traffic in and out of the proposed substation compound, access track to loop in interface mast structures and internal access track for compound use.

The substation will be unmanned. Maintenance personnel will visit the substation occasionally to undertake operations and maintenance. Maintenance vehicles accessing the site will park within the compound area.

The substation buildings and associated compound will be contained within a 2.6m high powder coated steel palisade fence.

4.11.3 External Grid Connection

A 110kV underground cable associated with the Proposed Grid Connection within a single trench extending approximately 8km from the proposed onsite substation to the Philipstown Substation.

To cross sensitive features such as the Leitrim watercourse and the Bord na Móna rail track, Horizontal Directional Drilling (HDD) will be employed. This trenchless method involves drilling beneath obstacles using a guided rig and bentonite fluid to support the bore. Launch and receiving pits will be constructed at either end of the crossing, with careful environmental protection and fluid containment measures in place.

Where land drains or existing underground services are encountered, the trench will either pass over or under them depending on available cover. A minimum clearance of 300mm is required between the ducting and any existing service.

Additionally, joint bays and communication chambers will be installed approximately every 500–1,000m along the route to connect cable segments. These chambers will be precast or cast in situ, with excavation areas protected against runoff and sediment loss. Once installed on a prepared base, the chambers will be backfilled and sealed, ensuring continuity and durability of the grid connection infrastructure.

4.12 Turbine Delivery Route

All turbine components for the proposed development will arrive at one of Ireland's deepwater ports, such as Bellview in Co. Waterford. From here, the components will travel via the national road and motorway network to Junction 5 (Kilbeggan/Tullamore) on the M6. Components will travel south on the N52 towards Tullamore. Due to vertical and horizontal alignment constraints the turbine blades and tower sections will take different routes from the N52/L2025 roundabout near Tullamore to Ballinagar village. An overview of the proposed section is shown in **Figure 4-7**. Route B uses a local road (L2025) in order to get through Ballinagar, to reduce impact on the local road, this route will be used to transport the blades, which are the long abnormal load items. The more numerous shorter loads (such as the tower elements) will use Route A along the proposed TDR, which maximises the use of regional roads.

The Turbine Delivery Assessment Report is available in **Appendix 2-2 of the EIA**.

The delivery of turbine components to the proposed development will require temporary works on sections of the public road network along the delivery route including hedge or tree cutting, relocation of powerlines/poles, lamp posts, signage and temporary local road widening. Such works will be temporary for the delivery of turbine components. There are three locations where works will be required within private lands and these are included in the planning application boundary.

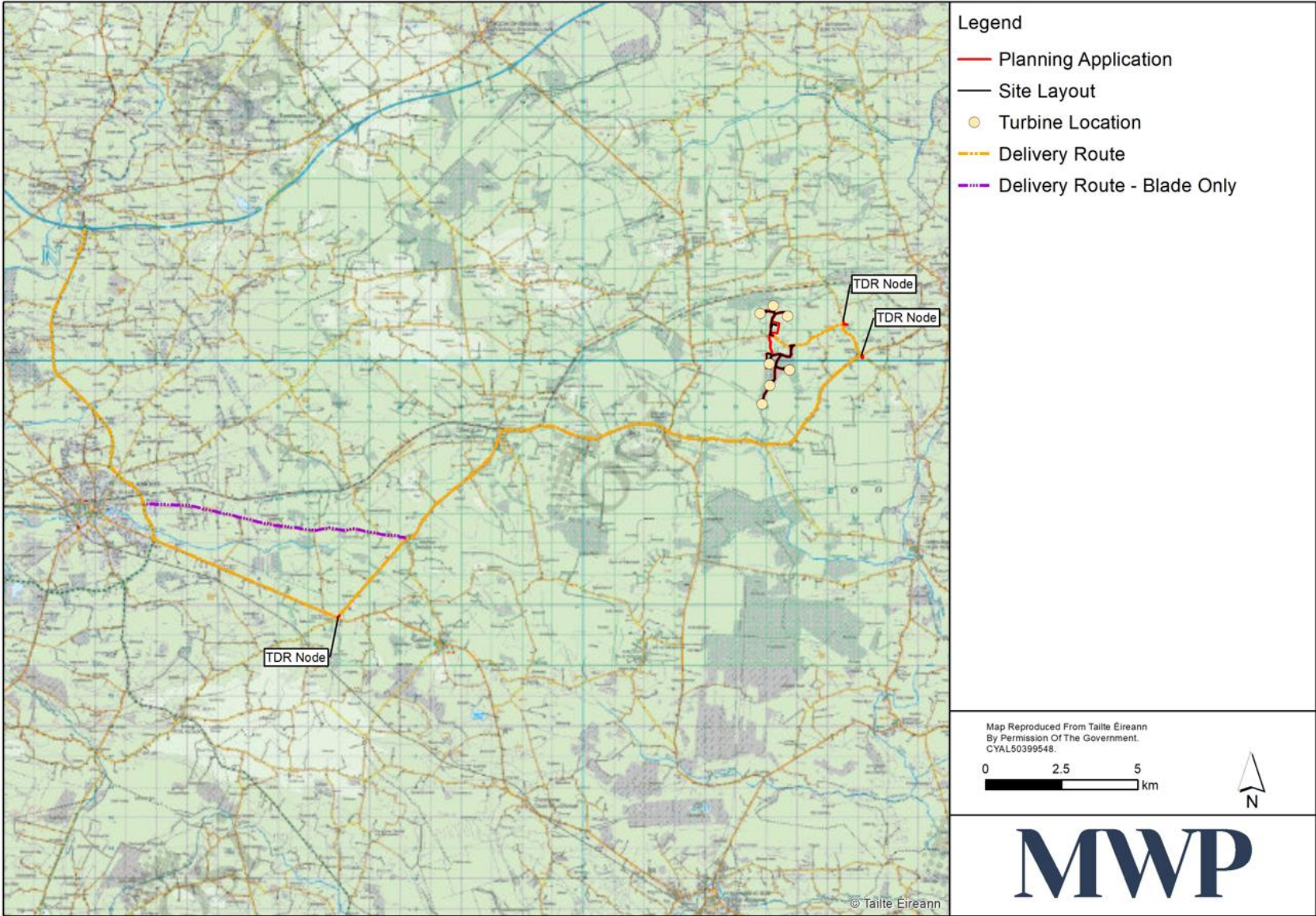


Figure 4-7 Proposed TDR M6 to Ballinla Wind Farm

4.13 Wind Turbine Generator Erection

The erection of turbines will occur in the last months of the construction phase. The erection of turbines is typically phased at an average of one turbine erected per week. The erection of turbines is a specialist process with specially designed large scale cranes required to erect the turbine components. The cranes themselves have to be built up onsite at the turbine hardstand location and will have to be dismantled substantially before progressing to the next turbine base location for erection of the next turbine.

Components can be placed on hardstands prior to assembly. Large cranes will be required for erecting the turbines, supported by smaller assist cranes. The tower of the turbine is erected first followed by the nacelle and blades. The turbine erection process is a carefully managed and precision operation and is heavily dependent on specialist plant and good weather windows. Once the turbine is in place, electrical commissioning and final energisation follows.

The Project Manager for the site will notify Offaly County Council and AirNav Ireland at least 30 days prior to erection of the wind turbines.

After the turbines have been put in place, the project manager will provide confirmation of the coordinates of the as constructed positions of the turbines and the highest point of the turbines to the top of blade spin to the AirNav Ireland.

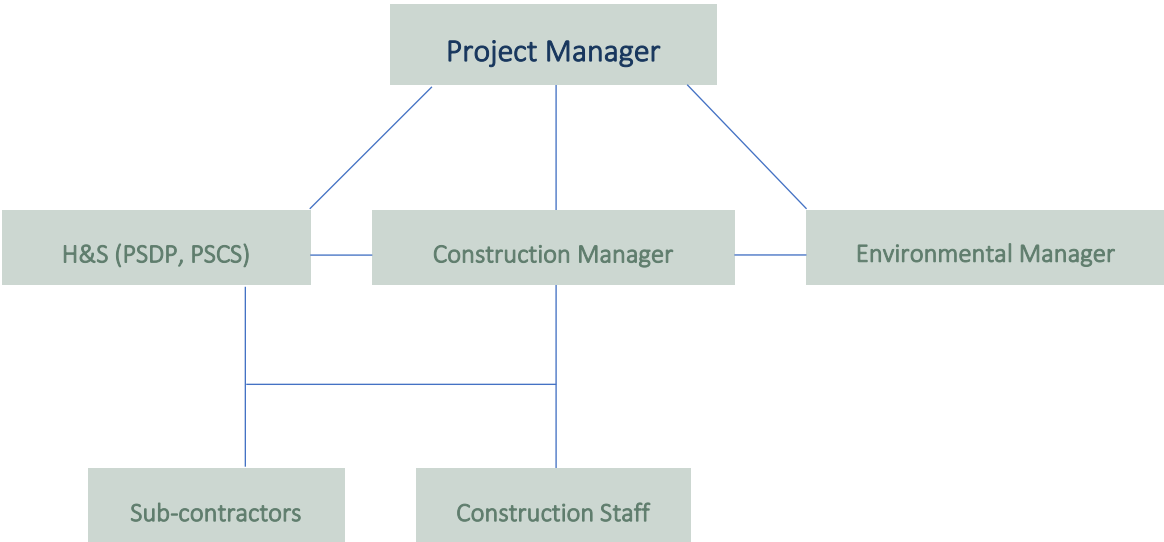
4.14 Wind Farm Commissioning

The final stage of the project construction includes commissioning of the wind farm. It will include testing of the turbines for compliance with standards and for compliance with the National Electricity Grid Code. Once the tests results are satisfactory, the Proposed Wind Farm will be authorised by ESB Networks/EirGrid to export electricity onto the national grid.

5. Construction & Environmental Management – Organisational Structure, Duties and Responsibilities

5.1 On Site Organisational Structure and Responsibility

The Organisational Structure for the Contractor’s Project Team is included below. This structure is defined by the Contractor and will include the names of the assigned personnel with the appropriate responsibility and reporting structure reflected.



The Contractor will select the Project Team for the construction of the Project. The Contractor’s Project Team will include an overall Project Manager, whose duties will stretch beyond the day-to-day works to budgetary, procurement and scheduling matters. The selected Construction Manager will have overall responsibility for the construction site personnel carrying out the works and the Construction Manager will report to the Project Manager.

A competent Environmental Manager will be appointed for the duration of the works and will report to the Project Manager. The Construction Manager will communicate regularly with the Environmental Manager to ensure mitigation measures are applied to specific works. The Environmental Manager will carry out tasks as required, including installation and maintenance of sediment control measures and implementing and maintaining approved waste management control measures. The use of dedicated staff, under the direction of the Environmental Manager, will ensure the environmental controls are in situ ahead of the works onsite.

5.2 Duties and Responsibilities

The general role of key people on site implementing the CEMP will be:

- The Project Manager - liaises with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the main contractor(s)'s project team.
- The Construction Manager - liaises with the Environmental Manager when preparing site works where there is a risk to the environment and manages the construction personnel and general works.
- The Design Engineer - undertakes and certifies the Design and supervises the standard of works, including geotechnical aspects (Geotechnical engineer may need to be consulted).
- The Environmental Manager - ensures that the CEMP is developed, implemented and maintained. The Environmental Manager's tasks at the construction site are described in **Section 5.2.4**. To ensure adequate cover of environmental tasks, waste management tasks and responsibilities, dedicated construction staff will be assigned to the Environmental Manager to implement and maintain the Sediment and Erosion Plan and any other measures required.

Other roles include:

- Project ecologist/Ecological Clerk of Works (ECOW).
- Health and Safety (PSDP and PSCS).
- Project Archaeologist.
- Project Ornithologist.
- Waste Management Coordinator (report to the Environmental Manager).
- Geotechnical Engineer (as required by Design Engineer).

5.2.1 Project Manager

Name: TBC

A Project Manager is to be appointed on behalf of the main Contractor(s) to manage and oversee the entire project. The Project Manager is responsible for:

- Implementing of the Construction and Environmental Management Plan (CEMP).
- Implementing the Health and Safety Plan.
- Management of the construction project.
- Liaison with the client/developer.
- Liaison with the Project Team .
- Assigning duties and responsibilities in relation to the CEMP.
- Production of construction schedule.
- Materials procurement.
- Maintaining a site project diary.

5.2.2 Construction Manager

Name: TBC

The Construction Manager manages all the works to construct the project, on behalf of the Contractor. The Construction Manager reports to the Project Manager. In relation to the CEMP, the Construction Manager is responsible for:

5.2.2.1 Site-Specific Method Statements

- Liaising with the Environmental Manager in preparing site-specific Method Statements for all work activities where there is a risk to the environment, by incorporating relevant Environmental Control Measures and referring to relevant Environmental Control Measure Sheets.
- Liaising with the Environmental Manager in reviewing and updating site-specific Method Statements for all Works activities where Environmental and Waste Management Control Measures and Environmental Control Sheets have been altered, and
- Liaising with the Environmental Manager where third party agreement is required in relation to site-specific Method Statements, Environmental & Waste Management Control Measures and/or Environmental Control Measure Sheets.

5.2.2.2 General

- Being aware of all project environmental commitments and requirements.
- Ensuring that all relevant information on project programming, timing, construction methodology, etc., is communicated from the Project Manager to the Environmental Manager in a timely and efficient manner in order to allow pre-emptive actions relating to the environment to be taken where required.
- Programming and planning of excavation works and communicating this schedule to the Environmental Manager.
- Ensuring that adequate resources are provided to design and install any environmental interventions.
- Liaising with the Design Engineer and providing information on environmental management to the Design Engineer during the course of the construction phase.
- Liaising with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the Contractor's project staff.
- Ensuring that the Environmental Manager performs regular and frequent environmental site inspections.
- Reviewing and approving all waste management control measures ensuring compliance with National and International Waste legislation and best practice.

5.2.3 Design Engineer

Name: TBC

The Design Engineer is responsible for:

- Design of the Works.
- Review and approval of relevant elements of the method statements – assist the Construction Manager with the overall review.
- Participating in Third Party Consultations.
- Liaising with Third Parties through the Environmental Manager.

5.2.4 Environmental Manager

Name: TBC

The Environmental Manager is responsible for:

- General
 - Being familiar with the project environmental commitments and requirements.

- Being familiar with baseline data gathered for the various environmental assessments and during pre-construction surveys.
 - Assisting the Construction Manager in liaising with the Design Engineer and the provision of the information on environmental management to the Design Engineer during the course of the construction phase.
 - Liaising with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the Contractor's project staff.
 - Implementing the environmental procedures of the CEMP.
 - Liaising with the Construction Manager to ensure that the control measures set out in the Schedule of Environmental Mitigation are implemented.
 - Liaising with the client/developer in relation to environmental issues.
 - Auditing the construction works from an environmental viewpoint.
- Site-Specific Method Statements
 - Liaising with the Construction Manager in preparing site-specific Method Statements for all Works activities where there is a risk to the environment. These site-specific Method statements will incorporate relevant Environmental Control Measures and take account of relevant Environmental Control Measure Sheets.
 - Liaising with the Construction Manager in reviewing and updating site-specific Method Statements for all Works activities where Environmental Control Measure and Environmental Control Sheets have been altered.
 - Liaising with the Construction Manager where third party agreement is required in relation to site-specific Method Statements, Environmental Control Measures and/or Environmental Control Measure Sheets.
- Third Party Consultations
 - Overseeing, ensuring coordination and playing a lead role in third party consultations required statutorily, contractually and in order to fulfil best practice requirements.
 - Ensuring that the minutes of meetings, action lists, formal communications, etc., are well documented and that the consultation certificates are issued to the Design Engineer as required.
 - Liaising with all prescribed bodies during site visits, inspections and consultations.
 - Where new Environmental Control Measures are agreed as a result of third party consultation, ensuring that the CEMP is amended accordingly.
 - Where new Environmental Control Measures are agreed as a result of third party consultation, the Environmental Manager will liaise with the Construction Manager in updating relevant site-specific Method Statements.
 - Where required, liaising with the Construction Manager in agreeing site-specific Method Statements with third parties.
- Licensing
 - Ensuring that all relevant works have (and are being carried out in accordance with) the required permits, licences, certificates, planning permissions, etc.,.
 - Liaising with the designated licence holders with respect to licences granted pursuant to the Wildlife Act, 1976, as amended (if required).
 - Bringing to the attention of the Project, Design and Construction Team any timing and legal constraints that may be imposed on the carrying out of certain tasks.
- Waste Management Documentation
 - Holding copies of all permits and licences provided by waste contractors.

- Ensuring that any operations or activities that require certificates of registration, waste collection permits, waste permits, waste licences, etc., have appropriate authorisation.
 - Gathering and holding documentation with the respect to waste disposal.
- Legislation
 - Keeping up to date with changes in environmental legislation that may affect environmental management during the construction phase.
 - Advising the Construction Manager of these changes.
 - Reviewing and amending the CEMP in light of these changes and bringing the changes to the attention of the Contractor's senior management and subcontractors.
 -
- Specialist Environmental Contractors
 - Identifying requirements for specialist environmental contractors (including ecologists, waste contractors and spill clean-up specialists) before commencement of the project.
 - Procuring the services of specialist environmental contractors and liaising with them with respect to site access and report production.
 - Ensuring that the specialist environmental contractors are competent and have sufficient expertise to co-ordinate and manage environmental issues.
 - Co-ordinating the activities of all specialist environmental contractors on environmental matters arising out of the contract.
- Environmental Induction Training and Environmental Toolbox Talks
 - Ensuring that Environmental Induction Training is carried out for all the Contractor's site personnel. The induction training may be carried out in conjunction with Safety Induction Training.
 - Providing toolbox talks on Environmental Control Measures associated with Site-specific Method Statements to those who will undertake the work.
- Environmental Incidents/Spillages
 - Prepare and be in readiness to implement at all times an Emergency Response Plan.
 - Notifying the relevant statutory authority of environmental incidents.
 - Carrying out an investigation and producing a report regarding environmental incidents. The report of the incident and details of remedial actions taken will be made available to the relevant authority, the Design Engineer and the Construction Manager.
 - The Site Environmental Manager shall notify the Client of any complaints or environmental incidents within 24 hours of occurrence. Where significant incidents occur requiring the involvement of statutory authorities or emergency services or where any pollution events occur, the Client shall be notified within 1 hour.
 - Project Specific Note: In the event of encountering a spillage or contaminated land/buried waste being encountered, the Environmental Manager will contact MWP - Engineering and Environmental Consultants who have at their disposal Environmental Engineers and Scientists with experience in addressing spillage or contaminated land/buried waste. MWP - Engineering and Environmental Consultants have personnel based in three offices in Ireland and will be available to dispatch suitably qualified and experienced personnel at short notice in the event of an Environmental Incident.
- Site Environmental Inspections and Auditing
 - Carrying out regular documented inspections of the site to ensure that work is being carried out in accordance with the Environmental Control Measures and relevant site-specific Method Statements, etc.
 - Carrying out inspections of the site drainage system.

- Appending copies of the inspection reports to the CEMP.
- Liaising with the Construction Manager to organise any repairs or maintenance required following the daily inspection of the site.
- Accommodate audits by the Employer and/or independent auditing consultants during the project.
- Accommodate third party environmental auditing when required.
- During audits, the Environmental Site Manager shall make the necessary staff available during each audit and provide access to all documentation and site areas (and provide necessary induction and training to allow access where required).
- If there are any adverse findings arising from the environmental audits, the Environmental Site Manager shall be required to take prompt mitigation actions and provide written reports to the Employer detailing such mitigation.
- The Environmental Site Manager shall notify the Employer of any complaints or environmental incidents within 24 hours of occurrence¹. Where significant incidents occur requiring the involvement of statutory authorities or emergency services or where any pollution events occur, the Employer shall be notified within 1 hour.
- Environmental Records
 - The Construction Environmental Manager shall provide all CEMP documentation to the Client on completion of the site works. Reports arising during the site works, such as verification reports or waste disposal records shall be provided to the Client within one month of completion of the activity and may be subject to review.

5.2.5 Other Roles

5.2.5.1 Ecological/Environmental Clerk of Works (ECoW)

A suitable qualified and experienced ECoW will be employed during the construction phase of the project. Duties will include the review of all method statements, delivery of toolbox talks, undertaking of all required pre-construction surveys for protected species and monitoring of works throughout the construction phase to ensure all environmental controls and EIAR mitigation is implemented in full. As part of toolbox talks, contractor staff and other site personnel, as relevant, will be made aware of the procedure to follow if a protected species or their resting or breeding site, is encountered. The ECoW will closely work with the Environmental Manager.

The ECoW will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted and mitigated for in the EIAR. The ECoW will be responsible for pointing out boundaries of exclusion zones as outlined further below.

The appointed ECoW will have demonstrated professional experience in managing large-scale construction works affecting ecological receptors identified within the EIAR.

¹ Communication in respect of the project to regulatory or statutory bodies shall be undertaken by the Employer, unless otherwise agreed, except in the case of incident notification.

5.2.5.2 Health and Safety Personnel – To be updated upon appointment of Contractor(s)/finalisation of CEMP

The Health and Safety personnel for the construction project is appointed by the Contractor in line with the Construction Regulations:

- Carrying out duty of Project Supervisor Construction Stage (PSCS).
- Responsible for safety induction of all staff and personnel on site.
- Implementing the Health and Safety Plan.
- Auditing and updating the Health & Safety Plan.
- All other required legal duties.

5.2.5.3 Project Archaeologist – To be updated upon appointment of Contractor(s)

The Archaeologist may be appointed by the Developer or the Contractor(s) and is responsible for:

- Ensuring implementation of archaeological mitigation measures.
- Monitoring of groundworks associated with the development.
- Liaison with the Environmental Manager/Construction Manager.
- Liaison with the Project Manager/client/developer.

5.2.5.4 Project Ornithologist – To be updated upon appointment of Contractor(s)

The Ornithologist may be appointed by the Developer or the Contractor(s) and is responsible for:

- Ensuring all pre-construction (completed) and construction phase avian monitoring is conducted at the site.
- Advice on any mitigation required.
- Consultations with National Parks and Wildlife Service (NPWS).

5.2.5.5 Geotechnical Engineer – To be updated upon appointment of Contractor(s)

The Geotechnical Engineer may be appointed by the Developer or the Contractor(s) and is responsible for:

- Assisting the Design Engineer as required.
- Providing advice on geotechnical aspects of the works.

5.2.5.6 All Site Personnel – To be updated upon appointment of Contractor(s)

The site personnel appointed by the Contractor are responsible for:

- Adhering to the relevant Environmental Control Measures and relevant site-specific Method Statements.
- Adhering to the Health and Safety Plan.
- Reporting immediately to the Environmental Manager and Construction Manager any incidents where there has been a breach of agreed procedures including:
 - A spillage of a potentially environmentally harmful substance.
 - An unauthorised discharge to ground, water or air, damage to a protected habitat, etc.

5.3 Contacts

5.3.1 Main Contractor Contacts

Table 5-1: Main Contractor Contacts

Position Title	Name	Phone	Email
Main Contractor	TBC		
Project Manager	TBC		
Construction Manager	TBC		
Design Engineer	TBC		
Environmental Manager*	TBC		
Safety (PSCS)*	TBC		
Safety Officer*	TBC		
Site Emergency Number*	TBC		
Project Ecologist/Ornithologist	TBC		
Project Archaeologist	TBC		
Overall Project PSDP	TBC		

**24 hour contact details required*

5.3.2 Employer Contacts

Table 5-2: Employer Contacts

Position Title	Organisation	Name	Phone	Email
ECoW	Employers ECoW			
Project Archaeologist	Employers Archaeologist			
Overall Project PSDP	Safety (PSDP)			
Project Liaison Officer	Employers Public Liaison Officer			

5.3.3 Third Party Contacts

Table 5-3: Third Party Contacts

Organisation	Location	Name/Address	Phone	Email Address
Inland Fisheries Ireland	Galway	Teach Breac Earl's Island Galway H91 E2A2 Ireland	(091) 563118	info@fisheriesireland.ie
National Parks and Wildlife Service	North Eastern Division	District Conservation Officer	(01) 539 3175 (01) 539 3230	nature.conservation@chg.gov.ie
Environmental Protection Agency (EPA)	EPA	EPA Headquarters	(053) 9160600	info@epa.ie
Local Authority	Offaly County Council	Áras an Chontae, Charleville Road, Tullamore Co. Offaly R35 F893	(057) 9346800	customerservices@offalycoco.ie
Health and Safety Authority	Health and Safety Authority		(01) 6147000	wcu@hsa.ie
An Garda Síochána	Rhode Garda Station	Edenderry Road Rhode Co. Offaly R35 A363	(046) 9737002	
Emergency Services	Ambulance and Fire Service	Ambulance and Fire Service	999 or 112	

6. Environmental Commitments

6.1 Environmental Management Plans

A number of environmental management plans (EMP) have been prepared for managing the impacts of Construction Activities associated with the proposed development. See **Table 6-1** and refer to **Appendix 1** of this **CEMP**. These plans will be implemented by the Appointed Project Manager and/or Project Contractor(s) as relevant.

Once appointed, it is the Contractor's responsibility, to update and add (where required) project specific control measures relevant to the environmental management plans and procedures. The Contractor will ensure that plans/procedures are communicated to all site staff, including sub-contractors, through induction, training and at relevant meetings.

Table 6-1: Environmental Management Plans

Ref	Procedure
EMP-1	Management of Excavations
EMP-2	Surface Water Management and Runoff Control
EMP-3	Fuels and Oils Management
EMP-4	Management of Concrete
EMP-5	Construction Noise Management
EMP-6	Construction Waste Management Plan
EMP-7	Construction Traffic Management Plan
EMP-8	Construction Dust Management
EMP-9	Archaeological and Heritage Protection
EMP-10	Ecological Management Plan Protection of Habitats and Fauna
EMP-11	Landscape and Visual Management
EMP-12	Emergency Response Plan
EMP-13	Site Environmental Training and Awareness
EMP-14	Monitoring and Auditing
EMP-15	Environmental Accidents, Incidents and Corrective Actions
EMP-16	Environmental Complaints
EMP-17	Management of Material Assets
EMP-18	Invasive Species Management

6.2 Environmental Mitigation, Control Measures and Proposals

6.2.1 Biodiversity

During the construction phase of the Proposed Development, a robust suite of biodiversity mitigation measures will be implemented to safeguard protected species, habitats, and ecological integrity. These measures are designed to minimize disturbance, prevent habitat degradation, and ensure compliance with national guidelines and conservation best practices. Oversight by a qualified Ecological Clerk of Works (ECOW) will ensure that all mitigation actions are executed effectively and adaptively throughout the construction lifecycle, their duties will include:

- Deliver toolbox talks and ecological awareness training
- Conduct pre-construction surveys and oversee clearance works
- Monitor construction activities to ensure full implementation of EIAR mitigation
- Educate staff on procedures if protected species or breeding/resting sites are encountered

6.2.1.1 Protection of Fauna

- Retain all identified badger setts; none within 30–50m of turbines or tracks.
- Conduct pre-construction surveys for badger and otter within 10–12 months before works.
- ECoW to oversee vegetation removal and respond to discovery of unknown breeding/resting sites.
- Cease works within 30m (or 50m during breeding season) of any newly discovered badger sett.
- Consult NPWS and implement mitigation if new setts are found.
- Follow NRA/TII Guidelines for treatment of badger and otter.
- Avoid felling during peak breeding periods for red squirrel and pine marten.
- Survey for breeding sites if felling during sensitive periods is unavoidable.
- Avoid vegetation clearance during bird nesting season (Mar–Aug) to protect stoat.
- Seek NPWS approval for disturbance to breeding sites.
- Check for presence of young Irish hare, hedgehog, pygmy shrew, and hibernating hedgehogs before clearance.

6.2.1.2 Protection of Habitats

- Minimize footprint of works to reduce habitat disturbance.
- Clearly mark development and construction areas with posts and high-visibility tape.
- Mark boundaries using design drawings under supervision of project engineer and ECoW.
- Prohibit habitat removal, machinery movement/storage, or construction activity outside designated areas.

6.2.1.3 Removal of Vegetation (Excluding Conifer Plantation)

- Conduct all vegetation removal outside restricted bird nesting period (Mar 1–Aug 31).
- Comply with Section 40 of the Wildlife Acts to protect broader biodiversity.

6.2.1.4 Forestry Felling

- All tree felling will be undertaken in accordance with the conditions attached to the tree felling licence and in accordance with Forest Service Guidelines.
- Prepare harvesting plan and mapping including:

- Environmental receptors and water features.
- Biodiversity features and machinery selection.
- Silt/sediment control, timing, and extraction management.

6.2.1.5 Water Quality

- Prepare water monitoring programme for pre-, during, and post-construction phases.
- Conduct baseline water quality monitoring of nearby streams.
- Install silt ponds at access tracks and swales; retain post-construction.
- Monitor water quality regularly under varying weather conditions.
- Visually monitor for groundwater seepage, ponding, and drainage system effectiveness.
- Inspect site for siltation risks before construction; install check dams, sandbags, silt fences.
- Halt works during heavy precipitation if risk to water environment is identified.
- Cover temporary fills/stockpiles with polyethylene sheeting.
- Settle silty water and channel into vegetation $\geq 50\text{m}$ from watercourses.
- Re-vegetate exposed areas with top sod or suitable seed mix.
- Regular road cleaning and use of wheel washes.
- Use of check dams and silt fences on drains.
- Daily and weekly weather forecast monitoring.
- Daily, weekly, and monthly water quality monitoring.
- Follow best practice guidance from DHPLG (2019), IFI (2016), Murnane et al. (2006), NRA (2008).

6.2.1.6 Dewatering

- Remove, treat, and dispose of groundwater/surface water appropriately.
- Do not pump directly into trackside drains or watercourses.
- Pump silted water from turbine foundations to surface drainage system.
- Pump silted water from trenches/joint bays to designated percolation areas.
- Provide settlement ponds near tracks, borrow pit, hardstands, substation.
- Fill ponds with stone for safety or allow natural re-vegetation.

6.2.1.7 Cement Bound Granular Mixtures (CBGM)

- Store CBGM on hardstand or runoff-resistant areas with no direct drainage.
- Bund storage areas using sandbags, geotextile sheeting, or silt fencing.
- Wash concrete truck chutes at dedicated, bunded washout area.

6.2.1.8 Fuel Management

As per EMP3 in Appendix 1.

6.2.1.9 Construction Wheel Wash

- Use wheel wash for vehicles entering/leaving site.
- Route water residue through settlement pond.
- Clean wheel wash area regularly to prevent residue buildup

6.2.1.10 Temporary Construction Compound

- Direct compound drainage to oil interceptor.
- Provide bunded containment area for fuel/lubricant/oil storage.
- Remove compound after commissioning is complete.

6.2.1.11 Storage

Store materials, containers, stockpiles, and waste:

- Away from drains and sensitive habitats.
- On impermeable base, under cover, in secure areas.
- Away from moving plant and vehicles.
- Store containers upright and clearly labelled.
- Provide sufficient storage near working areas.

6.2.1.12 Excavation Works

As per EMP1 in Appendix 1.

6.2.2 Hydrology and Hydrogeology

6.2.2.1 Good Practice Measures

Implementation of good practice measures as a matter of course during the construction of the Proposed Development are not considered to be mitigation measures but form an integral part of the design/construction process.

During the Construction Phase, all works will be undertaken in accordance with the CEMP (MWP, 2025). Following appointment, the contractor will be required to further develop the CEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The CEMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development. These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

The appointed contractor will produce a Pollution Prevention Plan (or similar document). This will include procedures and diagrams for:

- Dewatering of excavations.
- Temporary soil storage.
- Fuel storage/refuelling.
- Concrete wash-out area.

- Controlling surface water entering Site.
- Preventing existing drainage features becoming pathways for construction runoff.
- Reducing soil exposure and reinstating as rapidly as possible.
- Contingency measures.

Emergency procedures will be developed by the main contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with best practice standards and legislative requirements including but not limited to the Environmental Protection Agency Act, 1992 (as amended), Waste Management Act, 1996 (as amended) and the Safety, Health and Welfare at Work Act, 2005 (as amended).

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards.
- All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

6.2.2.2 In-Stream Works

Where instream works are required for the construction of watercourse crossings and culverts, the following mitigation measures will be implemented to protect water quality and maintain the integrity of the receiving waterbodies:

- All instream and near-stream works will be carried out in accordance with:
 - Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016).
 - Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (2008).
 - CIRIA C648 – Control of Water Pollution from Linear Construction Projects (2006).
- No instream works will be carried out outside the permitted IFI window of July 1st to September 30th, to protect aquatic habitats and fish spawning periods.
- A qualified Environmental Clerk of Works (ECOW) will be present onsite during all instream works (e.g., bridge and culvert installations) to oversee environmental protection measures and ensure compliance with best practice.
- The ECOW will conduct regular water quality monitoring upstream and downstream of the works area to detect any changes and initiate corrective actions if necessary.
- Silt fences and sediment control measures will be installed as required to prevent sediment from entering watercourses.

- Prior to construction, defined works areas will be fenced off at each crossing location. Silt fences will be attached to these fences to create a barrier between the works and adjacent watercourses (e.g., the Leitrim stream and its tributaries).
- Silt fences will be constructed using geotextile membranes that allow water to pass through while retaining sediment.
- Heras fencing will be installed in front of the silt fences to prevent “site creep” — the gradual encroachment of construction activities toward sensitive areas.
- Precast concrete culverts will be used to minimise in-stream construction time and reduce the risk of pollution.
- Existing vegetation will be preserved where possible, and disturbed areas will be promptly replanted to stabilise soils and reduce erosion.
- All river protection measures (e.g., silt fences, settlement ponds) will be maintained in effective condition throughout the works and inspected regularly.
- Daily monitoring of silt fences and settlement ponds will be carried out by the contractor or ECoW, particularly during sensitive phases such as site clearance, concrete pours, and after heavy rainfall events.
- Maintenance of sediment control infrastructure will be undertaken as needed to ensure continued effectiveness.
- Monitoring frequency will be adjusted based on the stage of works and environmental conditions, with increased checks during high-risk activities or adverse weather.

6.2.2.3 Hydrological and Hydrogeological Flow Regime

Excavation, dewatering, and construction activities may disrupt natural surface and subsurface water flow paths, potentially altering the hydrological and hydrogeological regime. Mitigation and monitoring measures to limit potential impacts are as follows:

- Implement a site-specific surface water management system based on SuDS principles incorporating features such as:
 - Swales, filter drains, and attenuation basins to manage runoff volumes and rates.
 - Check dams and level spreaders to reduce flow velocity and promote infiltration.
 - Settlement ponds or silt traps to capture suspended solids before discharge.
- All watercourse crossings (e.g. for access tracks or cable routes) will be designed in accordance with OPW Section 50 requirements, ensuring that culverts or bridges are appropriately sized to accommodate the 1-in-100-year flood event plus climate change allowance.
- Crossings will be constructed using methods that maintain flow continuity and minimise in-stream works.
- Drainage infrastructure will be designed to replicate pre-development greenfield runoff rates and avoid increasing flood risk downstream.
- Maintain existing drainage patterns where possible; reinstate any disturbed field drains or watercourses post-construction.
- Use shallow recharge wells where dewatering is required to maintain local groundwater levels.
- All dewatering will be managed in accordance with best practice standards (i.e., CIRIA C750).
- The dewatering methodology to be implemented by the appointed contractor will ensure that any dewatering is confined to the localised zone and does not extend towards the site boundaries.
- Seal and backfill cable trenches to prevent preferential flow paths.
- Monitor groundwater levels during construction and adjust dewatering practices accordingly.

6.2.2.4 Sedimentation

The following mitigation measures would be implemented to reduce the potential for sedimentation during the construction phase:

- No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works.
- Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards).
- There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse.
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the buffer zone boundary.
- Where works are necessary inside the 20m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase.
- Drainage channels and streams will be clearly identified onsite and shown on method statements and site plans.
- During the construction activities there will be a requirement for diverting rainwater away from the construction areas, into nearby drainage channels and streams.
- Visual inspections of roads and wheel washing at site entry/exit points will be undertaken to prevent the accumulation of dirt.
- Excavations will only remain open for limited time periods to reduce groundwater and surface water ingress and water containing silt will be passed through a settlement pond prior to discharge.
- Dewatering, where required, will incorporate the use of filter media. There will be no direct discharges into the watercourses.
- Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and retained drainage channels, away from areas subject to flooding.
- To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.
- Where required, silt fences will be erected at the toe of stockpiles to prevent runoff. The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.
- Runoff from spoil heaps will be prevented from entering watercourses by diverting it through onsite settlement ponds and removing material as soon as possible to designated storage areas.
- Silt traps will be placed across the works boundary in any areas adjacent to watercourses to avoid siltation of watercourses. These will be maintained and cleaned regularly throughout the construction phase.
- Use biodegradable erosion control matting on exposed slopes.
- Phase vegetation clearance and re-seed disturbed areas promptly.
- Monitor and maintain sediment control measures daily, especially after rainfall events.

6.2.2.5 Accidental Spills and Leaks

The following mitigation measures would be implemented to reduce the potential for accidental spills and leaks during the construction phase:

- The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing.
- The main contractor will prepare method statements for weather and flood forecasting and continuous monitoring of water levels in the Leitrim stream and its tributaries. These will be made available to the local

authority where requested. The main contractor will also provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones in order to minimise the risk to persons working on the site as well as potential input of sediment or construction materials into the waterbodies during flood events.

- No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works.
- Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards).
- Wastewater from the construction welfare facilities will be managed by means of a sealed storage tank. All wastewaters will be removed from site by permitted waste collector to wastewater treatment plants.
- There will be no tracking of machinery within watercourses.
- There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse.
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary.
- Designate a bunded storage area at the contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater.
- Chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. All chemicals will be stored in designated bunded areas at least 15m away from watercourses.
- Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit.
- All plant and equipment utilised onsite will be maintained in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development. Only emergency breakdown maintenance will be carried out onsite.
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.
- Drip trays will be located under all static plant.
- Hoses and valves will be checked regularly for signs of wear and will be turned off and securely locked when not in use.
- Diesel pumps and similar equipment will be checked regularly, and any accumulated oil removed for appropriate disposal.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains.
- There will be no refuelling allowed within 15m of the watercourses.
- Where mobile fuel bowzers are used on the site, in the event of a machine requiring refuelling outside of the designated impermeable area, fuel will be transported in a mobile double skinned tank.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles.
- In the event of an accidental spillage, or water pollution incident, the site manager or designate shall notify the Local Authority as soon as possible.

6.2.2.6 Use of Cementitious Materials

Mitigation and monitoring measures to limit potential impacts associated with the use of natural resources throughout the course of the Proposed Development are as follows:

- No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works.
- Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards).
- Ready-mixed concrete will be brought to the site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water (for example storm water) to the underlying subsoil and groundwater.
- The pouring of concrete will take place within a designated area protected (for example by a geosynthetic material) to prevent concrete runoff into the soil/groundwater media.
- Any use of concrete in proximity to watercourses will be carefully controlled to avoid spillage. No onsite batching should occur. Washout from mixing will be carried out only in a designated contained impermeable area.
- Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to ground or surface waters will be strictly prohibited. Alternatively, where washout takes place onsite, it will be carried out in a designated, carefully managed onsite washout area.
- Wastewater from washing of concrete lorry chutes will be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area must be clearly marked and must be located away from storm drain inlets, open drainage facilities, water courses and ditches.

6.2.2.7 Flood Risk

Construction activities undertaken in or near flood-prone areas can significantly increase the risk of flooding and associated impacts on the water environment. Improper site drainage, obstruction of natural flow paths, or the alteration of existing hydrological regimes may exacerbate flood risk both on-site and downstream. These effects can lead to the mobilisation of sediments, pollutants, or construction materials into nearby watercourses, potentially degrading water quality and affecting the Water Framework Directive (WFD) status of receiving waterbodies. To mitigate these risks and ensure the protection of the water environment during flood events, the following mitigation measures are required:

- Develop and implement a Flood Risk Management Plan tailored to the site.
- Avoid storing materials, fuels, or machinery in flood-prone areas.
- Install temporary bunds, berms, or barriers to divert floodwaters from sensitive zones.
- Store hazardous substances above predicted flood levels and in secure, weather-resistant containers.
- Use permeable surfaces to reduce surface water flow.
- Regularly inspect and maintain site drainage systems.
- Monitor water levels during high-risk periods.
- Conduct pre and post flood inspections and adapt mitigation measures based on weather forecasts and site conditions.

6.2.2.8 Wastewater Management

Improper handling or unauthorised discharge of foul water or construction-related wastewater (e.g., from equipment washing or dewatering) could lead to contamination of surface water or groundwater, potentially affecting the WFD status of receiving waterbodies. The following mitigation measures are required:

- All foul water from temporary welfare facilities will be collected in sealed holding tanks and regularly removed offsite by a licensed contractor to a permitted wastewater treatment facility.
- No unauthorised discharge of water to ground or surface water will occur during the construction phase. All discharges will be subject to the appropriate consents under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from OCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.
- Where water must be pumped from excavations, it will be treated (e.g., via settlement or hydrocarbon interceptors) before discharge and only in accordance with the relevant discharge licence.
- All existing drainage channels and public sewers will be clearly identified, protected, and shown on site plans and method statements to prevent accidental discharge of untreated water.
- Under no circumstances will untreated wastewater from equipment washing, road sweeping, or other construction activities be released offsite.

6.2.3 Land and Soils

6.2.3.1 Soil Erosion

The following mitigation measures will be implemented to reduce the soil erosion during the construction phase:

- Areas of exposed soil will be minimised by phasing construction and reinstating disturbed areas as early as possible.
- Unnecessary stripping of topsoil and subsoil will be avoided by optimising the layout and reusing existing access tracks.
- Stockpiles of stripped topsoil will be in locations with minimum trafficking to prevent damage and dusting.
- Exposed soil surfaces will be stabilised using biodegradable geotextiles, mulch, or hydroseeding, particularly on slopes and embankments.
- Temporary soil stockpiles will be shaped and compacted to reduce erosion and will be located in sheltered areas away from construction traffic.
- Access tracks and hardstands will be constructed using clean stone and geotextile membranes to prevent soil disturbance and erosion.
- Brash mats or bog mats will be deployed on soft ground to protect soil structure and prevent rutting and surface erosion.
- Heavy machinery will be restricted to designated haul routes and will not traffic over stripped or stockpiled soils.
- Buffer zones will be maintained between soil storage areas and steep slopes to prevent slippage or downslope erosion.
- All exposed soil areas will be inspected regularly for signs of erosion, and corrective actions will be implemented immediately.
- An Environmental Clerk of Works (ECoW) will be appointed to oversee soil protection measures and ensure compliance with the CEMP.

- Stripped topsoil and subsoil will be reused in landscaping and reinstatement works as soon as practicable to reduce exposure time.
- The duration and intensity of construction traffic in sensitive areas will be limited to avoid over-compaction of subsoil layers.
- A log of soil management activities, inspections, and remedial actions will be maintained throughout the construction phase.

6.2.3.2 Soil Compaction

The following mitigation measures will be implemented to reduce the soil compaction during the construction phase:

- Works will be carried out in accordance with the TMP (**Appendix 15 of the EIAR**) to manage and control vehicular movement on site. Measures will include the scheduling of HGVs during the construction phase to reduce the number of vehicle movements in, through and offsite.
- Earthworks haulage will be along predetermined routes within the Development and any deliveries to site will be along existing national, regional, and local routes for importation and exportation of materials.
- Haulage with the Proposed Development will be along internal haul roads/access tracks, where practicable.
- Heavy vehicles will only follow designated and newly constructed access tracks and avoid loading areas which are not contained within the footprint of the main works to minimise disturbance of the original soil and subsoil formations and to retain soil structure.
- Machinery will not operate directly on excavated/stockpiled soils.
- Within and around excavations, pore water pressure will be kept low by avoiding loading the soil/subsoil and giving careful attention to the existing drainage.
- Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practicable, compaction of any soil or subsoil which is to remain in-situ along the site will be avoided.

6.2.3.3 Soil Stability

The following mitigation measures will be implemented to reduce the soil compaction during the construction phase:

- All temporary cuts and excavations will be designed and executed to ensure long-term stability or will be adequately supported using engineered solutions.
- Temporary works will be planned and implemented to avoid interference with existing drainage channels and natural flow regimes.
- A suitably qualified and experienced geotechnical or civil engineer will supervise all site excavations and construction activities.
- The contractor's method statements for each element of work will be reviewed and approved by the supervising engineer prior to commencement.
- Surface water interception drains will be installed upslope of all excavation areas prior to earthworks to prevent overland flow from entering exposed soil zones.
- A site-specific emergency response plan will be developed to address slope instability risks, particularly during the early excavation phase.
- The emergency response plan will include a rainfall-triggered alert system based on 24-hour advance meteorological forecasting (e.g. Met Éireann data).

- Construction activities will be suspended when rainfall exceeds a pre-defined threshold (e.g. >25 mm/hr or a 1-in-100-year storm event) and will only resume once conditions have stabilised and runoff has subsided.
- All plant, materials, and equipment will be stored in designated, level areas such as the temporary site compound and will not be placed on or near existing or newly formed slopes.
- Construction traffic will be routed to avoid surcharging or destabilising slopes, and no loading will occur near excavation edges or embankments.
- Where necessary, temporary slope reinforcement (e.g. geogrids, soil nails, or retaining structures) will be installed to maintain slope integrity.
- All excavations will be monitored for signs of instability (e.g. cracking, slumping, or water ingress), and corrective actions will be implemented immediately if required.
- A geotechnical risk register will be maintained throughout the construction phase, documenting inspections, rainfall events, and any slope-related incidents or interventions.
- All personnel will be briefed on slope stability risks and emergency procedures during site induction and toolbox talks.

6.2.3.4 Accidental Spills and Contamination/Pollution

The following mitigation measures would be implemented to reduce the potential for accidental spills and leaks during the construction phase:

- The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing.
- Designate a bunded storage area at the contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater.
- Chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. All chemicals will be stored in designated bunded areas at least 15m away from watercourses.
- Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit.
- All plant and equipment utilised onsite will be maintained in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development. Only emergency breakdown maintenance will be carried out onsite.
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.
- Drip trays will be located under all static plant.
- Hoses and valves will be checked regularly for signs of wear and will be turned off and securely locked when not in use.
- Diesel pumps and similar equipment will be checked regularly, and any accumulated oil removed for appropriate disposal.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains.
- Where mobile fuel bowsers are used on the site, in the event of a machine requiring refuelling outside of the designated impermeable area, fuel will be transported in a mobile double skinned tank.

- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles.
- Ready-mixed concrete will be brought to the site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water (for example storm water) to the underlying subsoil and groundwater.
- The pouring of concrete will take place within a designated area protected (for example by a geosynthetic material) to prevent concrete runoff into the soil/groundwater media.
- Any use of concrete in proximity to watercourses will be carefully controlled to avoid spillage. No onsite batching should occur. Washout from mixing will be carried out only in a designated contained impermeable area.
- Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to ground or surface waters will be strictly prohibited. Alternatively, where washout takes place onsite, it will be carried out in a designated, carefully managed onsite washout area.
- Wastewater from washing of concrete lorry chutes will be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area must be clearly marked and must be located away from storm drain inlets, open drainage facilities, water courses and ditches.
- Access tracks will be cleaned regularly during wet weather to prevent sediment build-up and runoff.
- The drainage and treatment system will be regularly inspected and maintained by assigned personnel, especially after heavy rainfall, to ensure it functions properly and prevents leaks or failures during construction.
- In the event of an accidental spillage or pollution incident, the site manager or designate shall notify the Local Authority as soon as possible.

6.2.3.5 Tree Felling

The following mitigation measures would be implemented to reduce the potential for felling impacts during the construction phase:

- Topsoil removed from felled areas will be reused in landscaping or placed in designated deposition areas.
- Vegetative layers will be stored right-side-up where possible to promote natural regrowth.
- Felling areas will be monitored and maintained post-construction and into the operational phase.
- Runoff from clear-felled areas will be managed using berms, silt traps, and settlement ponds to separate clean and dirty water.
- Discharge rates from drainage systems will be controlled to match pre-construction conditions using engineered settlement ponds.
- Brash mats will be used on soft ground to reduce soil erosion and prevent rutting; mats will be renewed when worn.
- Brash mats will also be provided along off-track routes where practicable to minimise soil compaction.
- All felling and reforestation works will comply with the Department of Agriculture, Food and the Marine's forestry standards (2019) and Forest Service licence conditions.
- Felling activities at the end of the forestry cycle will follow felling licence requirements and associated environmental mitigation measures.

6.2.4 Noise and Vibration

Notwithstanding the noise impacts being assessed as not significant, the following best practice measures will be implemented during construction of the Proposed Development:

- Fixed and semi-fixed ancillary plant such as generators, compressors etc. to be positioned to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures to be provided for specific items of fixed plant.
- All plant used onsite will comply with the EC Directive on Noise Emissions for Outdoor Equipment (2000/14/EC), where applicable.
- Operation of plant in accordance with the manufacturer's instructions.
- All major compressors to be 'sound reduced' models fitted with properly lined and sealed acoustic covers which are kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers.
- All plant used onsite will be regularly maintained.
- Machines in intermittent use to be shut down in the intervening periods between work or throttled down to a minimum.
- Drop heights of materials from lorries and other plant will be kept to a minimum.
- Adherence to the codes of practice for construction working given in BS 5228-1: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and the guidance given therein for minimising noise emissions from the site.
- Adherence to the codes of practice for construction working given in Noise and BS 5228-2: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration and the guidance given therein for minimising vibration emissions from the site.
- Compliance with normal construction working hours of 07:00 to 19:00 Monday to Friday, 08:00 to 14:00 on Saturdays. This excludes public holidays, emergency work provisions and other working periods which would be agreed in writing with the Planning Authority.
- Periodically check that mitigation measures are being implemented and are fit for purpose during the works with corrective action mechanisms in place.
- Local residents will be kept informed and provision of a contact name and number for any queries or complaints.
- All complaints of an environmental nature related to the operation of the activity will be recorded. Each such record shall give details of the date and time of the complaint, the name of the complainant (if provided), and give details of the nature of the complaint. A record shall also be kept of the response made in the case of each complaint.

Notwithstanding the vibration impacts being assessed as not significant, the following best practice measures will be implemented during construction of the Proposed Development:

- A clear communication programme will be established to inform closest building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars.
- Alternative less intensive working methods and/or plant items shall be employed, where feasible.

- Appropriate vibration isolation shall be applied to plant, where feasible.

6.2.5 Cultural Heritage

Prior to construction of the Proposed Wind Farm, a comprehensive archaeological mitigation strategy is essential to ensure the protection and proper documentation of any potential heritage assets. The following mitigation measures will be implemented prior to construction:

- Carry out a geophysical survey and test trenching should be carried out at the locations of each turbine and adjoining working area where soil removal is proposed as well as the location of the Proposed Substation and access road under licence from NMS.
- Arrange for licensed archaeological monitoring during all groundworks and record any finds.
- Ensure all archaeological work is done to the satisfaction of the Department of Housing, Local Government and Heritage (DHLGH) and the National Museum of Ireland (NMI).

6.2.6 Air Climate

6.2.6.1 Dust Generation

Construction phase generated dust will be minimised by the following measures :

- The use of water as a dust suppressant, e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise.
- Public roads will be inspected regularly for cleanliness and cleaned as necessary.
- All loads entering and leaving the site will be covered during dry periods if dust results in a disturbance on site.
- Control of vehicle speeds passing over access tracks and crane hardstanding areas within the site.
- Wheel wash facilities will be implemented at the site entrance from the public road to facilitate removal of any material collected by vehicles entering or leaving the site and preventing its deposition on public roads.
- Site stockpiling of materials will be designed and laid out to minimise exposure to wind.
- Daily site inspections will take place to examine dust measures and their effectiveness.

6.2.6.2 Construction Traffic Emissions

Construction traffic emissions will be reduced using the following measures:

- Ensure regular maintenance of plant and equipment. Carry out periodic technical inspection of vehicles to ensure they perform most efficiently.
- Implementation of the **TMP (Appendix 15 of EIAR)** to minimise congestion.
- All site vehicles and machinery will be switched off when not in use, and no idling of engines will be permitted.

6.2.7 Material Assets – Built Services

6.2.7.1 Grid Capacity and Electrical Infrastructure

- The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with ESB Networks.

- All works in the vicinity of ESB Networks infrastructure will be carried out in ongoing consultation with ESB networks and will be in compliance with any requirements or guidelines they may have including procedures to ensure safe working practices are implemented when working near live overhead/underground electrical lines.
- There is a slight chance of potential electricity outage during rerouting of the 38kV overhead line. Any outage will be kept to a minimum and any customers affected by a potential outage will be contacted prior to works commencing.
- The Proposed Development will not result in any significant effects on grid capacity but will provide a potentially positive effect of the electricity supply infrastructure. No specific mitigation measures are proposed beyond good construction practices.

6.2.7.2 Aviation

Whilst the Proposed Development will not impede aircraft, IAA Electronic Air Navigation Obstacle Data sets has identified obstacles as objects whose height above ground level is 90m or higher, affecting air navigation. IWEA Guidelines have set out the following measures to ensure that pilots of aircraft are fully aware of the presence of wind turbines.

- All turbines and meteorological masts having a height of 90m, or more are promulgated in the Irish Air Navigation Obstacle database.
- Wind turbines or any structure exceeding 90m in height may require appropriate aviation warning lighting as agreed with IAA.
- The IAA should be informed 30 days in advance of the erection of any structure exceeding 45m in height.

Having regard to the above:

- The developer will agree an aeronautical obstacle warning light scheme for the wind farm development with the IAA.
- The developer will provide the IAA with as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location.
- The developer will notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.

6.2.7.3 Water and Wastewater Infrastructure

- All water and wastewater networks potentially affected by the Proposed Grid Connection will be identified prior to construction.
- The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with Uisce Eireann or other relevant authorities.
- All works affecting the water and wastewater infrastructure will be carried out in ongoing consultation with the local authorities and service providers and will be in compliance with any requirements or guidelines they may have.
- All construction phase and operation phase wastewater will be taken offsite by an authorised waste contractor and brought to an authorised waste facility.

6.2.7.4 Waste Management

As per EMP6 in Appendix 1.

6.2.8 Material Assets – Traffic and Transport

As per EMP 7 in Appendix 1.

7. Auditing, Monitoring and Response

The environmental Monitoring Schedule (**Table 7-1**) will take cognisance of all mitigation measures outlined in the Environmental Report. The Monitoring Schedule for construction will also provide for the checking of equipment, materials storage and transfer areas and specific environmental controls.

The Contractor will assign a full-time Environmental Manager who will be on site to monitor the construction activities on a day-to-day basis. The duties will include completing the required checklists (sample checklist included below) and coordinating with the relevant personnel (e.g. Design Engineer as required) ensuring all environmental monitoring is carried out.

Table 7-1: Environmental Monitoring Schedule

Aspect	Area of Inspection	Monitoring Required	Note/Checks	Frequency	Responsibility
Surface Water Runoff Controls	Settlement ponds	Visual inspection	<ul style="list-style-type: none"> Leaks Cracks/broken plastic piling Build up of sediment & soil 	Regular/daily/weekly during the construction phase as well as during and after significant rainfall events	Environmental Manager
	Weather Forecast	Met Éireann download	Pre-determined rainfall trigger levels (e.g. 1 in 5 year storm event or heavy rainfall at >25mm/hr)		Environmental Manager
	Discharges from onsite sediment and erosion controls	Visual inspection	Colour, presence of silts	Regular/daily/weekly during the construction phase as well as during and after significant rainfall events	Environmental Manager
Water quality monitoring	Discharges from onsite sediment and erosion controls	Visual inspection	<ul style="list-style-type: none"> Unacceptable level of sediment/silt on the access track surface Presence of waste 	Weekly	Environmental Manager
	Internal site tracks Site Entrance	Visual inspection	<ul style="list-style-type: none"> Unacceptable level of sediment/silt on the access track surface Presence of waste Surface Condition 	Daily	Environmental Manager
	Water quality sampling at watercourses draining site	Water Samples	<ul style="list-style-type: none"> Minimum parameters: pH, Suspended Solids, metals , nitrates, phosphates 	Monthly	Environmental Manager
	Areas of concrete pours	Visual inspection	<ul style="list-style-type: none"> Monitoring of concrete pours to ensure no discharge of concrete to watercourses 	To be scheduled with pours	Environmental Manager
Archaeology	Area of ground works & excavations	Visual Inspection	<ul style="list-style-type: none"> Archaeological monitoring during ground works & excavations 	To be scheduled with ground works & excavations	Archaeologist
Waste Management	Material and Waste Storage	Daily	<ul style="list-style-type: none"> Monitoring of waste storage areas to ensure correct waste management practices are being applied 	Daily	Project Manager/Environmental Manager

Aspect	Area of Inspection	Monitoring Required	Note/Checks	Frequency	Responsibility
Access Tracks	Fuel & Oil Storage areas	Visual inspection	<ul style="list-style-type: none"> • Damage to containers or ancillary equipment • Leakages • Unlocked storage container • Fuels stored within bunded area 	Daily	Project Manager
	Construction Materials Storage Areas	Visual inspection	<ul style="list-style-type: none"> • Damage • Untidiness 	Daily	Environmental Manager
Operation Control	Concrete pours	Visual inspection	<ul style="list-style-type: none"> • Runoff/spills 	Weekly	Project Manager
	Dust generation	Visual Inspection	<ul style="list-style-type: none"> • Cleanliness of tracks and compound area • Dust at stockpiles • Dust from delivery vehicles 	To be scheduled with pours	Project Manager

8. Environmental Performance Indicators

The Contractor will outline the key performance indicators for the site in gauging successful site management in the prevention of pollution and the protection of the environment.

Environmental performance indicators will include:

- Number of environmental accidents/incidents logged.
- Breach of procedure and corrective actions.
- Number of environmental complaints received.
- Results of monthly water quality monitoring.
- Results of noise and vibration monitoring, and
- Results of site audits.

The performance indicators will be communicated to all relevant personnel and sub-contractors. The review periods for analysing site performance indicators will also be specified.

8.1 Response Procedure/ Corrective Action

In the event of an environmental incident, or breach of procedure, or where a complaint is received, or in the event of encountering buried waste or contaminated soils/groundwater, the contributing factors are to be investigated and remedial action taken as necessary. The Contractor will ensure that the following respond actions will take place:

- The Project Manager will be informed of any incident, breach of procedure and/or complaint received and details will be recorded in the incident/complaint register.
- The Project Manager will conduct/co-ordinate an investigation to determine the potential influence that could have led to the non-compliance.
- The Project Manager will notify and liaise with the appropriate site personnel where required, e.g. Site Environmental Manager, ECoW, Project Archaeologist.
- The Project Manager will notify the Client of any complaints or environmental incidents within 24 hours of occurrence. Where significant incidents occur requiring the involvement of statutory authorities or emergency services or where any pollution events occur, the Client will be notified within 1 hour.
- If necessary, the Project Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Incident/Complaints Form which is to record information such as the cause, extent, actions and remedial measures used following the incident/complaint. The form will also include any recommendations made to avoid reoccurrence of the incident.
- The Project Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Designer and Client as appropriate.
- The Site Project Manager will ensure that the relevant environmental management plans/procedures are revised and updated as necessary.

Appendix 1

Environmental Management Plans

Appendix 1

Environmental Management Plans

- EMP-1 Management of Excavations
- EMP-2 Surface Water Management and Runoff Control
- EMP-3 Fuels and Oils Management
- EMP-4 Management of Concrete
- EMP-5 Construction Noise Management
- EMP-6 Construction Waste Management Plan
- EMP-7 Construction Traffic Management Plan
- EMP-8 Construction Dust Management
- EMP-9 Archaeological and Heritage Protection
- EMP-10 Ecological Management Plan Protection of Habitats and Fauna
- EMP-11 Landscape and Visual Management
- EMP-12 Emergency Response Plan
- EMP-13 Site Environmental Training and Awareness
- EMP-14 Monitoring and Auditing
- EMP-15 Environmental Accidents, Incidents and Corrective Actions
- EMP-16 Environmental Complaints
- EMP-17 Management of Material Assets
- EMP-18 Invasive species and Biosecurity

EMP1: Management of Excavations

Purpose

To describe measures for the management of all excavations and excavated soil and rock on the site.

Procedure

General

Bulk excavations will be done during dry weather periods so as to avoid run off from exposed excavation areas. Weather will be monitored during the project and no excavation works will be allowed during severe or heavy rainfall events.

All temporary cuts/excavations will be carried out such that they are stable or adequately supported. Where appropriate and necessary, cuts and excavations will be protected against ingress of water or erosion by the use of cut off drains around the excavation works. Temporary works will be such that they do not adversely interfere with existing drainage channels/regimes.

Plant and materials will be stored in approved locations only (such as the proposed site compound) and will not be positioned or trafficked in a manner that would surcharge existing or newly-formed slopes.

Vehicular movements will be restricted to the footprint of the permitted development, particularly with respect to the newly constructed access tracks. This implies that machinery will be kept on existing/newly formed tracks/hardstands/yard areas and aside from advancing excavations, do not move onto areas that are not permitted for the development.

Management for Slope Failure/Ground Instability

All site excavations and construction will be supervised by a suitably qualified and experienced engineer. The Contractor's method statements for each element of work will be reviewed and approved by the engineer prior to site operations. Specific method statements will be developed for each turbine and hardstanding location within the site.

Prior to excavation, drains will be established to effectively intercept overland flow prior to earthworks.

The existing network of drainage within the site will be utilised whenever possible.

Management and Storage of Excavated Materials and Soil Management

Site management will include the checking of equipment, materials storage and transfer areas, drainage structures and their attenuation ability on a regular basis during the construction phase of the project. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations.

Excavated Material Storage

All soils generated from excavation works within the wind farm associated with turbines, access track, substation, grid connection and internal cable construction will be retained on site and reused in bunding, landscaping and restoration of the deposition area. No soils will be removed from the site. Permanent stockpiling of soils will not take place.

During excavations in the existing tracks, excavated material will be temporarily stockpiled adjacent to the section of trench, with appropriate material used as backfill. Appropriate siltation measures will be put in place prior to excavations. Stockpiles will be stored a minimum of 50m back from rivers/streams on level ground with a silt barrier installed at the base.

Temporary Storage of Excavated Material

No permanent stockpiles will be left on site after the completion of the construction phase works. After completion of the turbine base reinstatement works all remaining stockpiles are to be removed for permanent disposal at the proposed deposition areas within the site.

Any materials excavated during the construction phase which are to be used in the site reinstatement and landscaping process shall, in the first instance, be stored on site in an environmentally safe manner that will not result in the pollution of waters or the smothering of ecologically sensitive habitats.

Excavation works relate mainly to trench digging and excavations. The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of excavation works:

- Earth movement activities will be suspended during periods of prolonged rainfall events.
- The earthworks material will be placed and compacted in layers to prevent water ingress and degradation of the material.
- Drainage and associated pollution control measures will be implemented on site before the main body of construction activity commences.

Any temporary onsite stockpiles of soil, rock and other excavated material will be removed and utilised in the site reinstatement programme to infill any excavated areas which will then be mounded and capped with sod prior to the completion of works.

The following principles will be adhered to when considering the temporary storage of excavated materials.

- Spoil disposal will take place within a 30m radius of each structure.
- Preparation of the spoil disposal site will involve the removal of the “top mat” which will be transplanted to a suitable area and maintained for re-use during restoration operations.
- Spoil will be deposited, in layers of 0.5m and will not exceed a total thickness of 1m.
- Spoil will only be deposited on slopes of less than 5 degrees to the horizontal and greater than 10m from the top of a cutting. The exact location of such areas will be confirmed on consultation with the geotechnical engineer.
- Once reinstatement is complete the disposal sites will be re-vegetated with the “top mat” removed at the commencement of disposal operations.
- Upon commencement of the restoration phase, guidance from a suitably qualified environmental professional will be sought to confirm the methodology and programme.

It is proposed that any temporary onsite stockpiles of soil, rock and other excavated material shall be removed and utilised in the site reinstatement programme to infill any excavated areas which will then be mounded and capped with sod prior to the completion of works.

Permanent Deposition Areas

A deposition area is proposed on the site near turbine 4. The deposition area will be used for the permanent storage of the excavated spoil material generated from the construction of the turbine bases, crane hardstands, substation and internal access track.

Excess cohesive material will be placed around the perimeter of the deposition pit and will act to retain peat material stored inside the perimeter. The cohesive material will be laid at a shallow batter angle of max 20 degrees and up to a maximum height of 2m .

The area will then be enclosed with three layers of silt fencing to prevent sediment runoff. Water buildup within the disposal area will not be permitted.

Upon completion, the surface of the deposited spoil will be profiled to a gradient not exceeding 5%.

Following completion, it is proposed to replant the deposition area.

Monitoring

This is to be detailed in the Contractors Final Method Statement.

Responsibility

- The Environmental Manager will monitor the excavation areas and associated drainage.
- The Construction Manager will monitor vehicle movements throughout the construction phase.
- The Project Manager will oversee the phasing of the excavation and machinery movement across the site.
- Construction personnel will be informed of the measures to prevent pollution of water courses.
- The Design Engineer, Geotechnical Engineer and Sub-contractors will have responsibilities as appropriate.
- All responsibilities will be finalised by the Appointed Contractor.

EMP 2: Surface Water Management and Run off Control

Purpose

To describe measures for the management of all surface water and runoff on the site, for the protection of watercourses and in particular, sediment and erosion control.

Surface Water Protection Measures

Surface water runoff management will be required to prevent runoff entering excavations during construction. Surface water will require diversion around the open excavations using standard temporary drainage methods to ensure that surface water is effectively conveyed around works areas.

All open water bodies adjacent to areas of proposed works, including settlement ponds, will be protected by fencing. A 20m buffer will be retained for construction works from EPA mapped watercourses. Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards).

Entry to the Leitrim stream and its tributaries by vehicles will be avoided, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids. No instream works will take place outside the period July 1st to September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.

To prevent elevated levels of erosion and sedimentation at the site during the construction phase, surface water at the site will be managed and controlled via the newly constructed site surface water management system to attenuate runoff, guard against soil erosion and safeguard downstream water quality. Silt traps, silt fences and settlement ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase. As a minimum, silt fencing will be provided at all water crossings, and the settlement ponds will be designed to ensure they are not overwhelmed by one-off adverse precipitation events. The silt fencing and settlement ponds will be monitored daily by the appointed contractor and silt will be removed as required.

Where practical, cut-off V drains will be utilised to divert water entering the site and reduce the amount of water to be managed onsite. Attention will be given to the maintenance and protection of all drains and temporary channels to minimise scour and the mobilisation of suspended solids (e.g. lining with hessian or clean stone, check dams, silt fencing etc).

The silt fences and settlement ponds will be monitored to ensure that they remain functional throughout construction of the Proposed Development. Where necessary, maintenance will be carried out on the fences and settlement ponds to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the appointed contractor or ECoW. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of watercourses and during and after storm events. It is noted that the frequency of monitoring will depend on the stage of works, and local environmental conditions. The frequency of checks will be increased during critical works including the initial decommissioning works, during concrete pours and after storm events.

Where required, standard design and construction measures (i.e., groundwater drainage around impermeable subsurface structures) will ensure that groundwater flow across the site is maintained and that there will be no impact on groundwater levels.

The main contractor will prepare method statements for weather and flood forecasting and continuous monitoring of water levels in the Leitrim stream and its tributaries. These will be made available to the local authority where requested. The main contractor will also provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones in order to minimise the risk to persons working on the site as well as potential input of sediment or construction materials into the waterbodies during flood events.

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the Construction Phase of the Proposed Development will be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility. Therefore, there will be no potential impact on water quality and the WFD status of receiving waterbodies and any Natura 2000 sites associated with discharges from the site.

Silt control will be a primary concern during the construction stage, as silt has been identified as a sediment source to downstream areas. Silt ponds will be required as mitigation at access tracks and swales within the proposed development site as these are considered an effective method of retaining silt. The design of these features will be in accordance with best practice, oversized and retained post construction.

During the construction phase of the project, water quality in the streams and outflow from the drainage and attenuation system will be monitored, field-tested and laboratory tested on a regular basis during different weather conditions. This monitoring together with the visual monitoring will help to ensure that the mitigation measures that are in place to protect water quality are working effectively.

During the construction phase of the project, the development areas will be monitored regularly for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system to ensure it does not become blocked, eroded, or damaged during the construction process.

Prior to any construction activity being carried out, the subject part(s) of the proposed development site will be inspected for areas that may be prone to siltation of nearby rivers/streams and drains as appropriate. Where necessary, check dams, sand-bags and/or silt fences will be installed in adjacent trackside drainage ditches to ensure an optimum standard of water running into adjacent streams from the trackside drainage. During periods of heavy precipitation and runoff, works will be halted if posing a risk to the water environment or working surfaces/pads will be provided to minimise soil disturbance. Any requirement for temporary fills or stockpiles will be covered with polyethylene sheeting of suitable grade/gauge to avoid sediment release during periods of heavy rainfall.

Additional infrastructure and measures used to control water quality will include:

- Settling out as far as reasonably practicable any silty water generated on site through drainage mitigation measures (silt traps, etc.) and channelled into suitable vegetation (as defined by ECoW) at least 50 m from watercourses.
- Establishing vegetation on exposed areas by using top sod or reseeded with a suitable seed mix.
- Regular road cleaning.
- Use of wheel washes.
- Use of check dams on drains to slow water velocity.
- Use of silt fences on drains to reduce sediment loading.
- Daily and weekly weather forecast monitoring.

- Programme of daily, weekly, and monthly water quality monitoring.

All design and works in proximity to watercourses will follow the best practice guidance outlined in the following documents:

- Draft Revised Wind Energy Development Guidelines (DHPLG, 2019).
- Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters (IFI, 2016).
- Control of water pollution from linear construction projects' (Murnane et al. 2006).
- Guidelines for the crossing of Watercourses during Construction of National Road Schemes (NRA, 2008).

Instream works

All works requiring instream works during the construction of watercourse crossings and culverts will include the following measures:

- The ECoW will be present onsite during instream works (i.e., bridge crossings and culverts) to ensure there is no potential for surface water runoff to the receiving waterbodies. The ECoW will undertake regular monitoring of water quality upstream and downstream of the works area to detect any changes and take corrective actions if necessary.
- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the watercourse.
- Prior to the commencement of the construction works, small defined works areas will be fenced off at the location of the proposed crossings (between the main construction site and the water courses). Silt fences will be attached to these fences. The silt fences will provide a solid barrier between the proposed works and the Leitrim stream and its tributaries. The silt fences will be constructed of a suitable geotextile membrane to ensure water can pass through, but that silt will be retained.
- Heras fencing will be installed in front of the silt fencing at the Site to prevent "Site creep", the progressive movement of site activities towards this silt fence.
- The proposed culvert crossings will be constructed from precast concrete to allow its construction offsite.
- Existing vegetation will be preserved where possible and replant disturbed areas promptly to stabilize soil and reduce erosion.

It will be ensured that all river protection measures will be maintained in good and effective condition for the duration of the proposed works and checked regularly to ensure that the silt fencing and other mitigation measures are operating effectively.

All instream works or works carried out in or adjacent to watercourses will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

EMP 3: Fuel and Oils Management

Purpose

To describe measures for the management of all fuel and oils on site for the protection of watercourses from any spills.

Procedure

Refuelling will be carried out using a bunded mobile bowser. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using. Plant nappies or absorbent mats will be placed under refuelling points during all refuelling to absorb drips. Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas, away from drains and open water.

Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits, all oil and any contaminated material will be removed and properly disposed of in a licensed facility. Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery. Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction. In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

During the construction phase, fuelling and lubrication of equipment will be carried out in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities offsite). Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded and located away from surface water drainage and features. Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013).

The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing.

To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor.

The main contractor will ensure that strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed off-site.

There may also be the requirement for use of portable generators or similar fuel containing equipment during the Construction Phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

Emergency procedures will be developed by the main contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with best practice standards and legislative requirements including but not limited to the Environmental Protection Agency Act, 1992 (as amended), Waste Management Act, 1996 (as amended) and the Safety, Health and Welfare at Work Act, 2005 (as amended).

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards.
- All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.
- Refuelling will be carried out using 110% capacity double bunded mobile bowsters. The refuelling bowster will be operated by trained personnel. The bowster will have spill containment equipment which the operators will be fully trained in using.
- Mobile bowsters, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water.
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits. The nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery.
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

All plant will be refuelled on site e.g. excavators, dumpers etc, while rigid and articulated vehicles will be fuelled off site as will all site vehicles (jeeps, cars and vans). At construction stage, a Fuel Management Plan will be developed specific to the site and the particular plant and equipment required for construction.

The plan outlined will have regard to the following elements:

- Mobile bowsters, tanks and drums will be stored in a secure, impermeable storage area, away from drains and open water.
- Fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Ancillary equipment such as hoses, pipes will be contained within the bund.
- Taps, nozzles or valves will be fitted with a lock system.
- Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage.

All below ground drainage infrastructure will be constructed in accordance with current UE requirements to ensure that there are no potential impacts to groundwater quality.

Responsibilities

The Construction Manager and Environmental Manager are responsible for ensuring Fuel and Oils are managed in line with this procedure. The Contractor, in updating the CEMP, will designate personnel to the tasks relating to Fuels and Oil, as outlined above.

Reference

Best Practice Guidelines BPGCS005 – Oil Storage Guidelines (Enterprise Ireland).

EMP 4: Management of Concrete

Purpose

To describe measures for the management of concrete on site for the protection of watercourses from any spillages.

Procedure

Supervision of Concrete Pours

- To reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Environmental Manager.
- The Construction Manager will ensure that the area of the pour is completely drained of water before a pour commences.
- Pours will not take place during forecasted heavy rainfall.
- Incidental rainfall from light showers during the period of a pour is typically absorbed into the concrete matrix but heavier showers can result in some run off from the top surface of the concrete pour. If runoff is encountered, the Environmental Manager will block the outflow from the drains to retain or treat the runoff until the pH is neutral before discharge to the drainage network.
- In the event of a spillage on site, the Environmental Manager will temporarily block the dirty water drains in the immediate area and monitor the pH levels of the water in the associated settlement ponds and if necessary will adjust the pH levels using CO₂ entrainment. Any spillage will be cleared immediately and deposited in the chute wash down area.

Concrete Water

- Pours will not take place during heavy rainfall.
- There will be no onsite batching of concrete. concrete requirements will be met by ready-mix suppliers.
- To reduce the volume of cementitious water, washout of concrete trucks will not take place on site.
- Concrete trucks will be washed out off site at the source quarry.
- To reduce the volume of cementitious water, only concrete truck chutes will be washed down on site, reducing water volume to approximately 25 liters. The concrete trucks will wash down their chutes at a designated chute wash down area in the site compound. The wash down area will consist of a polythene lined bunded area with a capacity of about 20m³. This capacity will be sufficient to accommodate the chute washdown from the various anticipated concrete pours. The system is sealed with no overflow discharge to the drainage system.
- Any overflow of water will be collected in the site compound drainage system which will be connected to a settlement pond for treatment prior to discharge to the external drainage system.
- The concrete sediment in the construction compound washout area will be removed at regular intervals.

Responsibilities

- All concrete pours will be supervised by suitable personnel.
- The environmental manager will monitor the pH of the water in the chute wash out bund and can dose with CO₂ or acidic water from the drains until the wash out water achieves neutrality before discharge.
- The Environmental Manager is responsible for ensuring that appropriate water pollution prevention measures are put in place and that water sampling is carried out. Where standards are breached he/she will carry out an investigation and in conjunction with the Construction Manager, he/she will ensure remedial action is taken and further samples taken to verify that the situation has returned to normal.
- The Environmental Manager is responsible for ensuring spill kits are readily available in vulnerable locations and that booms for watercourses are long enough and have adequate anchorage.

EMP 5: Construction Noise and Vibration Management

Purpose

To describe measures for the management of impacts from construction noise.

Procedure

Control of Noise at Source

- Plant will be properly and regularly maintained.
- Compressors, if needed, will be 'sound related' models fitted with properly lined and sealed acoustic covers which will be kept closed whenever machines are in use.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers.

Construction Phase

Best practice in the form of BS5228 –1&2:2009 + A1 2014, *Code of Practice for the Control of Noise and Vibration on Construction and Open Sites* will be adopted during the construction phase in order to minimise the noise generated by construction activities and nuisance to neighbours.

Wherever possible the contractor will inform residents where appropriate of the proposed blasting times (if blasting is required) and any deviation from this programme in advance. Where blasting takes place, it will be restricted to regular times. Each blast will be carefully designed to maximise its efficiency and reduce transmission of noise. These details will be finalised by the appointed contractor in agreement with the local authority and design team prior to any blast taking place and documented in a Blast Management Plan. The Blast Management Plan will include full details of the locations of the bores for the blasts, the types of materials to be used, details of the necessary controls and responsibilities, and compliance with the relevant safety legislation.

All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations 1996 (SI 359/1996) and other relevant legislation.

Vibration levels will not exceed those described in BS5228 –1&2:2009 + A1 2014, *Code of Practice for the Control of Noise and Vibration on Construction and Open Sites*.

Responsibility

The Construction Manager will be familiar with the noise sensitive receptors and alert the Environmental Manager in good time prior to work commencing in the areas closest to any noise sensitive receptors.

The Environmental Manager will review any relevant planning conditions in updating this plan.

References

BS5228 –1&2:2009, *Code of Practice for the Control of Noise and Vibration on Construction and Open Sites*

IOA GPG Supplementary Guidance Note 5: *Post Completion Measurements* (July 2014).

Details of management of noise on the site to be finalised by Appointed Contractor

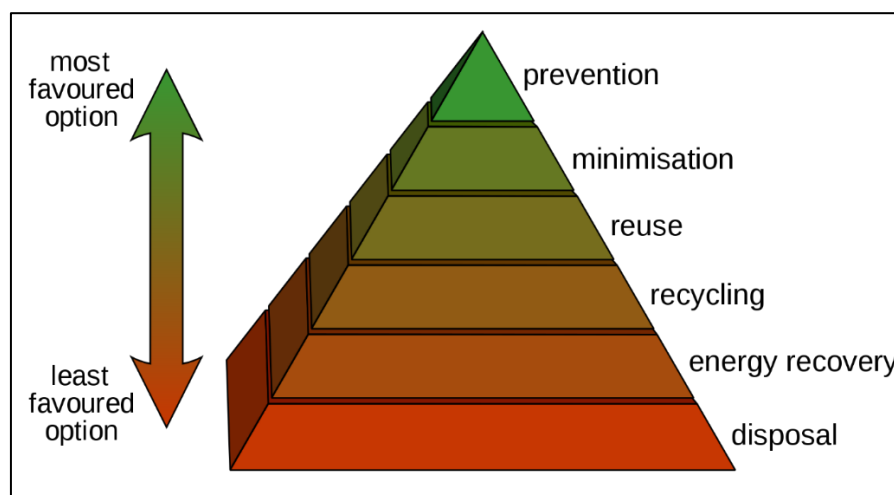
EMP 6: Construction Waste Management Plan

Purpose

To describe measures for the management of all wastes associated with the construction of the wind farm.

Procedure

- Waste Management Plan:
 - Waste will be managed in accordance with the waste hierarchy in Council Directive 98/2008/EC on waste and section 21A of the Waste Management Act 1996, as amended, as follows:
 - (a) Prevention.
 - (b) Re-use.
 - (c) Recycling.
 - (d) Other recovery (including energy recovery).
 - (e) Disposal.



- All waste for offsite treatment/disposal will be stored temporarily in appropriate dedicated storage areas. The areas in which wastes are stored on site will be segregated to prevent material and contaminated surface water runoff entering local surface water drains.
 - All chemical, hydrocarbon or other controlled wastes will be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required.
 - All waste to be removed from site will be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice and the site waste management plan.
- Construction and Waste Generated:
 - Contractors working on site during the works will be responsible for the collection, control and disposal of all waste generated by the works. Construction phase waste may consist of hardcore, stone, concrete, steel reinforcement, shuttering timber, food waste from the canteen and unused oil, diesel and building materials. This waste will be collected at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best practice procedures at an approved facility. Domestic wastewater from the onsite holding tank will be collected on a regular basis by approved contractors and disposed of in an authorised facility in

accordance with best practice. Plastic waste will be taken for recycling by an approved contractor(s) and disposed or recycled at an approved facility.

- Construction Compound:
 - Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, shuttering timber and unused oil, diesel and building materials. This waste will be stored in the construction compound and collected at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best practice procedures at an approved facility. Plastic waste will be taken for recycling by an approved contractor and disposed or recycled at an approved facility. Domestic type waste generated by contractors will be collected on site, stored in an enclosed skip at the construction compound and disposed of at a licensed landfill facility.
- General Waste Generation and Management:
 - Best practice procedures in general will minimise waste generated onsite. Measures including good site management will be taken to limit the quantity of waste generated during the construction phase. Waste such as excavated material onsite will be recycled where possible.
 - Surplus materials will include materials generated by the excavation works during construction of tracks and construction compound mainly comprising excavated excess sub-soils.
 - Waste streams will include wastes generated by plant, machinery and construction workers over the period of the works, for example waste oils, sewage, refuse (paper, carton, plastic etc), wooden pallets, waste batteries, fluorescent tubes etc.
 - Access to materials will be controlled. A dedicated storage area will be provided in the site construction compound for building materials such as cables, plastic piling for the settlement ponds, geotextile matting, blocks, tools and equipment, fence posts and wire, booms, pipes etc.
 - Access to stored materials will be restricted. the site compound will be securely fenced from the outset and will be locked when there are no site personnel present.
 - To contain and manage construction phase waste, multiple skips will be provided at the temporary site construction compound. one for recyclable waste and others for various construction waste. These skips will be emptied when required by a licensed waste management company. Waste oil and waste oil drums will be collected and stored in containers and on a bunded tray within the storage container.
 - At the end of each phase, the completed works areas will be tidied of any unused material or waste. this material will be brought to the site compound for storage and reuse or placed in the appropriate skip for disposal.
 - Construction waste (timber, steel, concrete etc) elements will be segregated and stored in dedicated bins on site for recycling.
 - Timber waste will be kept to a minimum through the re-use of shutters etc. throughout the works. At the end of the works, the majority of timber will be sent onto a new site for re-use. Any timber that cannot be re-used because of poor quality etc. will be recycled.
 - All waste steel reinforcing will be stockpiled and at the end of each work unit, it will be collected for recycling by a Licensed Facility.
 - Plastics and packaging will be segregated and stored in dedicated bins on site for recycling.

- Waste oil stored on site will be stored in labelled containers and will be collected by licensed facility/licensed oil-recycling contractor as necessary. Records will be maintained on the volumes of waste oil generated.
- Paper/cardboard will be recycled.
- Wastewater generated from the office and welfare facilities will be regularly emptied by licensed/suitable contractors.
- **Waste-Water Treatment/Effluent disposal:**
 - Wastewater from welfare facilities on site will drain to integrated wastewater holding tanks associated with the toilet units. The stored effluent will then be collected on a regular basis from site by a permitted waste contractor and removed to a licenced/permitted waste facility for treatment and disposal.
 - During the construction time period, wastewater production is estimated to be 3,000 litres per day (based on an estimated workforce of 60 people generating on average 50L/person).
- **Sustainable Resource and Waste Management:**
 - The principle objective of sustainable resource and waste management is to use material resources more efficiently, to re-use, recycle and recover material and to reduce the amount of waste requiring waste disposal. The value of products, material and resources is maintained in the economy for as long as possible such that the generation of waste is minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy. Resource efficiency techniques will include the following:
 - Excavated spoil will be resourced efficiently on site and will be reused for the backfilling, landscaping, and restoration around wind farm infrastructure such as turbines and hardstands. Dedicated spoil storage areas are proposed within the site. These will be used for generating material for the construction of access tracks and hardstands and for spoil storage.
 - When possible, soil to be removed from site will be treated as Article 27 by-product (a non-waste) or treated to comply with Article 28 if practicable and recycled if possible.
 - Spoil will also be stored around the turbines to a maximum height of 1m. The felled areas around the turbines have been identified as a potential additional area that will be used to store material. however, priority will be given to restoration of the dedicated spoil storage areas.
 - Berms will be formed along sections of access tracks and hardstands that will act as a physical edge protection measure to prevent vehicles falling off where a drop off greater than 1m exists from the road/hardstand edge. Spoil generated onsite will be used to create these berms.

Responsibility

The Environmental Manager will be responsible for adherence to correct waste management procedures. They will also identify a waste contractor to remove waste that can be recycled or reused.

The Environmental Manager will keep records provided by waste contractors of all waste being removed from site. The Environmental Manager will record waste removed from site regularly. This information will be recorded in a standard format. It will be the construction manager's responsibility to organise the removal of skips from their area when they are full.

The Environmental Manager will inspect waste segregation and temporary soil/rock storage stockpiles during his regular site visits.

Training

Copies of the Waste Management Plan will be available to all site personnel. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan for the site and informed of the responsibilities which fall upon them as a consequence of its provisions. This will be carried out during the site induction process for all site personnel. Where source segregation and materials reuse techniques apply, each member of the construction team will be given instructions on how to comply with the Waste Management Plan for the site. Site notices will be designed to reinforce the key messages of the waste management plan and will be displayed prominently for the benefit for all on site personnel.

Waste Records

All details of wastes (arising/generated/movement, etc.) will be recorded during the project. Each consignment of waste removed from the site will be documented in the form of a waste management movement record form which will ensure full traceability of the material to its final destination. All records will be retained at a designated location at the site office/construction compound and made available for auditing of the waste management plan.

References

Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, July 2006).

Design Out Waste: A design team guide to waste reduction in construction and demolition projects (EPA, 2015).

EMP 7: Construction Traffic Management

Purpose:

To describe measures for the management of all traffic, including construction traffic and oversized loads, for the minimisation of disturbance and nuisance to the local community.

Scope:

All Site Construction Areas, approach roads to the site and internal access track traffic.

Procedure:

All traffic management and road signage will be in accordance with the Department of Transport (DoT) Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Signs for Road Works. in agreement with Laois County Council and Offaly County Council.

In consultation with Offaly County Council's Roads Department, vehicle passing bays will be provided along the L5010, prior to the commencement of the proposed site construction, to facilitate two-way vehicle traffic movements.

A Traffic Management Plan (TMP) outlining the required traffic management procedures to be implemented on the public roads during the construction of the proposed development is included as **Appendix 3** in **EIAR Volume 3**. The Traffic Management Plan will be updated, as appropriate, following the proposed project detailed design/tendering stage, and submitted for the approval of Offaly County Council, prior to construction.

The Proposed Grid Connection will require a Road Opening License (ROL) prior to the commencement of any grid connection works on the public road. The road surface of the public roads will be reinstated to the standards set out by the Department of Transport (DoT) Guidelines on the Opening, Backfilling and Reinstatement of Trenches on Public Roads (April 2017). All road permanent reinstatement works will be in accordance with the requirements of Offaly County Council.

No construction delivery vehicles would access the site via the northern section of the L5006 and its Trimblestown Bridge on the Grand Canal.

A construction wheel wash facility will be provided at the construction compound to wash truck tyres leaving the construction site.

Responsibility

- Project Manager
- Construction Manager
- Construction personnel
- Sub-contractors as appropriate
- Delivery personnel

EMP 8: Construction Dust Management

Purpose

To describe the measures for the management of nuisance impacts on air quality from construction generated dust.

Procedure

A dust minimisation plan has been formulated for the construction phase of the project, as construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area.

It is not envisaged that a dust monitoring nor a sampling programme is required for this site. Ongoing good practice measure for the management of dust on site is to be implemented as set out below. Ongoing visual monitoring of dust will be carried out by Site Management.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented:

- The use of water as a dust suppressant, e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise.
- Site tracks and compound will be regularly cleaned and maintained as appropriate.
- Public roads will be swept to remove mud and aggregate materials from their surface.
- Furthermore, any track that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Speeds will be restricted on access tracks as site management dictates.
- Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary.
- Site stockpiling of materials will be designed and laid out to minimise exposure to wind.
- Daily site inspections will take place to examine dust measures and their effectiveness.
- A temporary vehicle wheel wash facility will be installed in proximity to the site entrance.
- Any materials leaving the site will be evaluated and covered if considered necessary to minimise potential dust impacts during transportation.
- The transportation contractor shall take all reasonable measures while transporting waste or any other materials likely to cause fugitive losses from a vehicle during transportation to and from site, including but not limited to:
 - o Covering of all waste or material with suitably secured tarpaulin/covers to prevent loss.
 - o Utilisation of enclosed units to prevent loss.

The dust minimisation plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

Construction Wheel Wash

A Construction Wheel Wash will be used for vehicle wheels and undersides entering and leaving the construction site. Water residue from the wheel wash will be fed through a settlement pond for settling out of suspended solids. The wheel wash area will be cleaned regularly so as to avoid the buildup of residue.

Responsibility

- The Environmental Manager is responsible for reviewing the site Dust Minimisation Plan.
- The Construction Manager is responsible for:
 - Organising dust suppression through use of bowsers and cleaners.
 - Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible.
 - Keep site fencing, barriers and scaffolding clean using wet methods.
 - Remove materials that have the potential to produce dust from site as soon as possible.
 - Cover seed of fence stockpiles to prevent wind whipping.
 - Ensure all vehicles switch off their engines when stationary – no idling vehicles.
 - Use enclosed chutes and covered skips.
- The Project Manager is responsible for:
 - Recording all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner.
 - Make a compliant log available to Offaly County Council when requested.
 - Record any exceptional incidents that cause dust or air emissions.

References

Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (Consultation Draft, National Roads Authority, October 2006).

Control of Dust from Construction and Demolition Activities (BRE, 2003).

EMP 9: Archaeological and Heritage Protection

The purpose of this plan is to describe measures for the management and protection of the archaeological and cultural heritage sites that have been found on the development site.

Archaeological Management Measures During Construction

Pre construction and during construction it is a recommended mitigation that the appointed contractor make provision for archaeological monitoring to be carried out under license to the Department of Housing, Local Government and Heritage (DHLGH) and the National Museum of Ireland (NMI), and will ensure the full recognition of, and the proper excavation and recording of all archaeological soils features, finds and deposits which may be disturbed in the course of the works. All archaeological issues will be resolved to the satisfaction of the DHLGH and the NMI. The archaeologist should be provided with information on where and when the various elements and ground disturbance will take place.

The risk of inadvertent impact on hitherto unknown buried archaeological material can be mitigated by archaeological monitoring of ground works associated with the project. It is recommended that a condition reflecting the suggested mitigation may form part of any grant of planning permission.

Responsibility

- Project Archaeologist
- Environmental Manager
- Construction Manager

EMP 10: Ecological Management Plan for the Protection of Habitats and Fauna

Purpose

To describe measures for the management and protection of habitats and fauna on the site.

Project Ecologist/Ecological Clerk of Works (ECoW)

A suitably qualified and experienced Project Ecologist/ECoW will be employed during the construction phase of the project. Duties will include the delivery of toolbox talks, undertaking of all required pre-construction surveys, clearance works, and monitoring of works throughout the construction phase to ensure all EIAR mitigation measures are implemented in full. As part of toolbox talks, contractor staff and site personnel will be made aware of the procedure to follow if a protected species and/or their resting and/or breeding site, i.e., badger sett, is encountered.

Protection of Fauna

A number of badger setts were identified during baseline ecology surveys, at least three of which were confirmed active at the time of surveying. These setts will be retained. None of the identified setts are located within 30m or 50m of a proposed turbine location or access track.

No otter holts were identified within the development site, however evidence of otter including spraint were found during ecology surveys. Pre-construction surveys for badger and otter will be undertaken prior to the commencement of any construction activity to identify any changes within the site with regard to protected mammals. Pre-construction surveys will be undertaken no more than 10-12 months prior to site works commencing.

Where areas of dense vegetation are to be removed, the Project Ecologist/ECoW will be present to oversee removal of vegetation and ensure any necessary mitigation measures are in place in the event that a previously unknown breeding or resting site of any protected mammal species e.g., badger sett, are encountered during the works.

If any new badger setts are discovered during the pre-construction surveys within or in proximity to the construction corridor, then all works within a 30 m buffer (50 m buffer during the breeding season) will cease. NPWS will be contacted, and the necessary mitigation implemented further to consultation.

Surveys and implementation of best-practice guidelines for badger and otter will be overseen by the ECOW and in accordance with NRA/TII Guidelines 'Guidelines for the Treatment of otters prior to the Construction of National Road Schemes' (NRA 2008) and 'Guidelines for the Treatment of badgers prior to the Construction of National Road Schemes' (NRA, 2008). Where relevant, mitigation for badger and otter will be carried out in full accordance with NRA/TII Guidelines.

Where possible, felling of forestry will be limited to periods outside of when red squirrel and pine marten are likely to have young in dreys/dens (peak period January to March for red squirrel, March and April for pine marten). If felling of forestry during these time periods is unavoidable, then the area to be cleared will be surveyed by a suitably-qualified ecologist to search for the presence of breeding sites. The general avoidance of removal of vegetation during the bird-nesting period (March to August, inclusive) will avoid disturbance to stoat during their peak breeding season.

Where any breeding sites will be disturbed, mitigation will be carried out under approval from NPWS as necessary and in full accordance with NRA/TII Guidelines.

Irish hare, hedgehog, and pygmy shrew are mobile species and so are expected to disperse from the area. however, young are vulnerable to impacts during vegetation clearance and/or during periods of hibernation, such as is the case with hedgehog. Prior to any vegetation clearance, the area to be cleared will be checked by a suitably-qualified ecologist to check for the presence of young mammals, or hibernating hedgehog, as appropriate.

NatureScot (2021) recommends a minimum 50 m buffer from the blade tip to the nearest key habitat features (e.g. woodland, hedgerow etc.) to be implemented to avoid encouraging bat activity within the 'blade-swept' area. These areas will be cleared of tall vegetation during the operational life of the development whilst existing hedgerow found within these buffer areas will be intensively managed to ensure the height is kept as low as possible (1 m – 1.5 m) whilst still retaining their function as field boundaries for livestock.

A methodology for determining the recommended clearance area at ground level is presented in NatureScot (2021). This buffer creates a clearance setback of 50 m between the arc of the blade's sweep and the forest edge which reduces risk of collision with the turbine blades. Based on this methodology, the following felling distances were calculated for each of the turbines: T1 = 77 m, T2 = 89 m, T3 = 77 m, T4 = 83 m, T5 = 91 m.

A modified buffer around turbines T6 and T7 will be required to ensure the stream and bordering tree lines, found in the southwest of the site, are retained. This feature was found to be used at a low activity level and by low numbers of individual species of bats. This approach is to ensure there is no net habitat change in this area. If the full SNH (2021) felling buffer area were to be applied at these turbine locations, this would create an opening within the current treeline along the stream corridor which could potentially encourage bat species to forage within this newly created open habitat and increase risk of collisions with turbine blades.

Control of regrowth of trees/encroachment of scrub will be managed and controlled within turbine felling buffer areas for the lifetime of the wind farm to maintain vegetation at low-height and thus retain recommended clearance setbacks around relevant turbines. Vegetation will be managed by appropriate mechanical means.

Any proposed lighting shall adhere to the following guidelines, taken from the Bat Conservation Trust 2023 'Guidance Note 08/23', to ensure that any unnecessary light spill from the proposed development and its potential impacts to any roosting, foraging and commuting bats are minimized. Lighting will only occur at substation during operations and will be motion sensed. Lights on turbines will be limited to those required for safe aviation, used to enhance the visibility of the turbines by aircraft.

- LED luminaires to be used due to the fact that they are highly directional, and have a sharp cut-off, lower intensity, good colour rendition and dimming capability.
- All luminaires should lack UV elements to reduce impact. Metal halide, compact fluorescent sources should not be used.
- A warm white light source (<2700 Kelvins) is to be adopted to reduce the blue light component).
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Internal luminaires can be recessed (as opposed to using a pendant fitting) where they are installed in proximity to windows to reduce glare and light spill.
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.
- Column heights will be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards. The shortest column height allowed will be used where possible.
- Only luminaires with a negligible or zero upward light ratio and with good optical control will be used.
- Luminaires should always be mounted horizontally with no light output above 90° and/or no upward tilt.
- Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate.

- Use of a Central Management System (CMS) with additional web-enabled devices to light on demand.
- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output and increased upward light scatter from surfaces. Therefore, they should only be considered in specific cases where these issues can be resolved.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the mitigating effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

Protection of Habitats

The area of proposed works will be kept to the minimum necessary to minimise disturbance to habitats and flora. The footprint of the development area and construction area will be clearly marked prior to commencement of construction with secure posts and high visibility tape. These areas will be marked out with reference to design drawings, under the supervision of the project engineer and ECoW. There will be no removal of habitat, movement/storage of construction machinery or any other construction related activities permitted outside the proposed development area.

Removal of Vegetation (excluding conifer plantation)

In accordance with Section 40 of the Wildlife Acts, vegetation removal, including hedgerow and tree removal, will be conducted outside of the restricted bird nesting period (March 1st to 31st August). The provisions of Section 40 of the Acts do not relate exclusively to birds, but to broader biodiversity, the protection of which will contribute to local food chains and ecosystem functioning.

Protection of Birds (avifauna)

Preconstruction

A re-confirmatory ornithological survey will be undertaken in March or April prior to the commencement of construction to identify any new breeding territories or nesting activity, particularly for species such as snipe and woodcock. Should any active nests be identified, works in those areas will be delayed until the breeding season has concluded or until fledging has been confirmed through monitoring. A 500m buffer will be applied around any confirmed snipe territories, and a 250m buffer will be maintained for woodcock.

Construction

To avoid disturbance to nesting birds, vegetation clearance, including removal of scrub and trimming of trees, will be undertaken outside the bird breeding season (March 1st to August 31st inclusive), subject to other environmental constraints such as runoff control. Where clearance is required during this period, a suitably qualified ecologist will carry out pre-clearance surveys to identify any active nests. If nesting birds are present, appropriate mitigation will be implemented, including the establishment of species-specific buffer zones and/or seasonal constraints based on the known breeding cycles of the species involved. For example, a minimum buffer of 10 metres will be applied around active small passerine nests, while raptor species such as kestrel, peregrine, or merlin will require a 500m buffer. Lower sensitivity raptors such as sparrowhawk and buzzard will be afforded a 200m buffer, and woodcock nests (if identified) will be protected by a 250m exclusion zone.

A re-confirmatory ornithological survey for wintering birds will also be undertaken during the winter months. In the event that grazing whooper swans are recorded within 600m of the Proposed Development prior to construction, targeted monitoring will be undertaken to assess potential disturbance or displacement. If significant disturbance is observed, or if regular use of the area by wintering swans is confirmed, a 600m exclusion

zone will be implemented until the birds have departed in spring. Similar monitoring and exclusion protocols will be applied for lapwing (both breeding and non-breeding seasons) and golden plover (non-breeding season), based on their observed use of the site and surrounding habitats.

Where possible, works in the vicinity of areas (shown on Figure 7-4 of the EIAR) which could potentially be used by roosting hen harrier on a casual basis during winter will avoided/minimised during the winter season. If works are required in these areas during winter, the ECoW will undertake roost watches to check for hen harrier activity and if required, working hours in the vicinity of these areas shall be restricted to avoid night, dawn and late afternoon/dusk.

Construction activities will generally be restricted to daylight hours to minimise disturbance to roosting and nocturnal bird species. Where night-time works are unavoidable, such as during concrete pours or turbine erection, these will be supervised by the project ecologist or Environmental Clerk of Works (ECoW). All construction personnel will receive toolbox talks on ornithological sensitivities and the importance of adhering to mitigation protocols.

Finally, turbine lighting will be designed to minimise attraction of nocturnal migrants and insects. White lights will not be used. Where required by the Irish Aviation Authority, turbines will be fitted with medium-intensity fixed red obstacle lights (2000 candelas), equipped with baffles to direct light skyward and reduce ground-level visibility.

Responsibility

- Environmental Manager
- Construction Manager
- Environmental Clerk of Works

References

Refer to EIAR Chapter 6 Biodiversity and Chapter 7 Ornithology

EMP 11: Landscape and Visual Management

Purpose

To describe measures to avoid, reduce or remediate, wherever possible significant negative landscape and visual effects of the Construction Stage of the proposed development.

Management Measures for Landscape and Visual

The following mitigation measures are proposed:

- Landscaping will be carried out where necessary during the construction phase, specifically in the vicinity of the substation.
- Mitigation measures including the reinstatement of areas following the construction phase, including replanting of hedgerows with native species similar to what is to be removed will be carried out. The deposition areas will be re-vegetated.
- Areas of cut and fill will be minimised and any bare will naturally re-vegetate (or as otherwise advised by ecologist).

Responsibility

- Environmental Manager
- Construction Manager

EMP 12: Emergency Response Plan

Purpose

To describe measures for the prevention of an environmental accident or incident and the response required to minimise the impact of such an event.

Procedure

In the event of an environmental emergency, all personnel will react quickly and adhere to this procedure.

All site personnel will be inducted in the provisions of the Emergency Response Plan.

The following outlines some of the information, on the types of emergency, which must be communicated to site staff:

- Release of hazardous substance – Fuel and oil spill.
- Concrete spill or release of concrete or silt.
- Flood event – extreme rainfall event.
- Environmental buffers and exclusion zones breach.
- Housekeeping of materials and waste storage areas breach.
- Stop works order due to environmental issue or concern (threat to archaeological or ecological feature).
- Fire on site (cross-reference site Safety Emergency Plan as appropriate).

If any of the above situations occur, the Emergency Response Plan is activated. The Environmental Manager will most likely be responsible for overseeing the Emergency Response Plan (to be confirmed by the Appointed Contractor(s)) and will be prepared and ready to implement the plan at all times. The Environmental Manager will be immediately informed and report to the scene. He/she must be aware of the:

- Nature of the situation – brief description of what has happened.
- Location of the incident.
- Whether any spill has been released.
- Whether the situation is under control.

Oil Spillages

The following list outlines issues likely to be appropriate for inclusion in the plan:

- Site staff will report the spillage immediately to the Environmental Manager or Construction Manager.
- Where relevant, the Environmental Manager will report the spillage to Inland Fisheries Ireland and Offaly County Council.
- Where possible, the source of pollution will be identified.
- Switch off all sources of ignition.
- Stop the spillage spreading.
- Use absorbent materials from the spill kit to mop up the spill (sand or absorbent materials will be used rather than detergents).
- Place boom across watercourse or in nearby downstream existing drains as a precaution.
- Do not wash spillage into drainage system. Washing will only make the situation worse and extend the pollution to other water bodies/drainage systems.
- If the spill has already reached drains, block the inlet of the dirty water cross pipes in the nearby drainage outflow points on the trackside drains with oil absorbent booms, which will prevent oils flowing into the existing drains.
- Shovel contaminated sand/earth/absorbent granules into sacks or skips.
- A specialist oil removal company will remove pooled oil.

Concrete Spillages

The following list outlines issues likely to be appropriate for inclusion in such a plan:

- Site staff will report the concrete spillage immediately to the Environmental Manager or Construction Manager.
- Where relevant, the Environmental Manager will report the spillage to Inland Fisheries Ireland and Offaly County Council.
- If there is a risk of concrete spreading into the drainage system, the inlet of the dirty water cross pipes in the nearby drainage outflow points on the trackside drains will be blocked using the absorbent booms, which will prevent concrete flowing into the existing drains.
- Do not wash spillage into drainage system. Washing will only make the situation worse and extend the pollution to other water bodies/drainage systems.
- If the spill has already reached drains, acid may be added to the drains by the Environmental Manager to neutralise the alkalinity of the concrete.
- Shovel contaminated concrete granules into sacks or skips for treatment in the trackside Concrete Wash unit.

Contacts

As an Environmental Control Measure, the Environmental Manager will append the relevant contact details to the Emergency Response Plan document. Examples of such contact details include:

- Environmental Manager.
- Specialist oil removal company.
- Offaly County Council.
- Inland Fisheries Ireland.
- National Parks and Wildlife Service.

Location of Emergency Spill Kits

- A map indicating the location of all emergency spill kits will be attached to the Emergency Response Plan document.
- Emergency oil spill kits will also be carried in all site vehicles and machinery and in the site office.

Responsibility

- The Environmental Manager will prepare and finalise an Emergency Response Plan to be ready to respond to any incident.
- All site personnel will report any spillages of oil or chemicals to the Environmental Manager and Construction Manager immediately.
- As appropriate, the Environmental Manager will report the spillage to the Regional Fisheries Board, Offaly County Council and any other relevant authority.

EMP 13: Environmental Training Awareness

Purpose

To describe measures for informing the public of no public access to the construction site and the training of all site personnel in the protection of the environment and the relevant controls.

Scope

Notification to the public of no public access to the site. All site personnel and construction teams which may influence environmental impacts.

Procedure

Site signage will be provided at the entrance to the site to inform the public that access to the site is restricted to those directly involved in the construction of the proposed development.

External to the site, areas of knotweed will be clearly barriered off with signage warning that access to the area is not permitted.

An initial site environmental induction and ongoing training will be provided to communicate the main provisions of the CEMP including this EMP to all site personnel. Two-way communication will be encouraged to promote a culture of environmental protection.

The following outlines some of the information which will be communicated to site staff:

- Environmental procedures of the CEMP.
- Housekeeping of materials and waste storage areas.
- Environmental Emergency Response Plan.

Housekeeping and Storage of hazardous materials

- Hazardous materials will only be stored in a secure storage container in the temporary site construction compound.
- Sub-contractors will provide a copy of the Material Safety Data Sheets for all hazardous substances brought onsite.

All finalised CEMP policies will be adhered to, in the management of fuels and oils, concrete, and installation of sediment and erosion controls and drainage features. All finalised details will be communicated with site personnel. Environmental Training including spill kit training, installation of silt fence training is to be provided by the Appointed Contractor(s). Environmental training records will be retained in the site office.

Responsibility

- Construction Manager
- Environmental Manager
- All site personnel

EMP 14: Monitoring and Auditing

Purpose

To describe measures for environmental monitoring during the construction works and audit of control measures to ensure environmental protection.

Procedure

All mitigation measures, any planning conditions and relevant construction methods will be monitored on site. The Contractor will nominate an Environmental Manager for the works. The Environmental Manager will provide Audit Checklists to ensure regular checks of the site's control measures for the ongoing protection of the environment.

Monitoring

Monitoring will be carried to ensure adherence EMPs 1 to EMP 18.

Checklists for daily, weekly or monthly site audits will be finalised by the Environmental Manager and the relevant personnel informed of their duties. Checklists will include (but are not limited to) confirmation that fuel is stored appropriately, waste management rules are adhered to, all environmental buffers are maintained, surface water and runoff control measures are in place and functioning, and concrete chute wash-out procedure is being followed. Checklists will be finalised with the Contractor's EOP.

All environmental records, including completed checklists, will be retained at the site office.

Responsibility

- Project Manager
- Environmental Manager
- Construction Manager
- Project Ecologist
- Project Archaeologist

EMP 15: Environmental Accidents, Incidents and Corrective Actions

Purpose

To describe measures for the recording, investigating and close-out of any environmental accidents or incidents on the site.

Procedure

- The Environmental Manager or Construction Manager will be contacted as soon as possible where there is any incident that carries the possibility of negative environmental consequences (e.g. minor oil leakage or blockage of drainage pipe).
- The Emergency Response Plan and standard emergency procedures will be applied to get the incident under control and prevent injury or loss of life in the first instance.
- Work in the area will be halted and the Environmental Manager will be called to the scene to assess the situation and to decide on initial responses and remedial measures.
- Once the situation is under control, the environmental accident or incident will be recorded and the cause investigated.
- Any remedial action required will be taken to mitigate any damage and prevent a reoccurrence.
- Corrective actions will be communicated to personnel and sub-contractors where relevant – particularly where it results to a change in procedure.

Example list of environmental accidents & incidents

- Accidents involving a large spill of fuel or concrete from delivery truck (emergency response required).
- Spills of fuel and oil (minor).
- Waste or rubbish left around the site (not in dedicated waste areas).
- Breach of any buffers (archaeological, ecological, watercourse).
- Failure of any control measures (silt fences collapsed in a storm).
- Concrete chute wash out in a non-dedicated area.
- Unplanned vehicle movement off the access tracks.
- Unplanned vehicle movement within a buffer zone.

Responsibility

- Site staff will contact the Environmental Manager or Construction Manager as soon as possible where there is any incident that carries the possibility of negative environmental consequences.
- The Environmental Manager is responsible for alerting the relevant authorities.

EMP 16: Environmental Complaints

Purpose

To describe measures for the recording and resolving complaints by third parties, including local residents or members of the public.

Procedure

Any environmental complaints received, whether internal or external, will be recorded and investigated. Immediate action will be taken as relevant to resolve environmental complaints to avoid any nuisance to the local community or any environmental damage.

This procedure includes:

- Recording of any complaints to a Site Log.
- Follow up by the relevant site representative – Environmental Manager.
- Remedial measures where required.
- Ongoing communication with complainant to confirm resolution.
- Any required training or communication with site personnel and sub-contractors as a result.

The out of hours contact number for the site is: TBC

Responsibility

- Project Manager
- Environmental Manager
- Construction Manager

EMP 17: Management of Material Assets

Purpose

To describe measures to avoid, reduce or remediate, wherever possible significant negative material assets effects of the Construction Stage of the proposed development.

Management Measures for Material Assets

The following mitigation measures are proposed:

Forestry Felling

Overall, felling of appropriately 21 ha of commercial forestry will be required. All tree felling will be undertaken in accordance with the conditions attached to the tree felling licence and in accordance with Forest Service Guidelines. Harvesting is the main of two forest operations that can cause nutrient runoff to water bodies and contribute to their eutrophication unless mitigating measures are taken. The *Forestry and Water Quality Guidelines* (DMNR, 2000) and *Standards for Felling & Reforestation* (DAFM, 2019) describe best practice that must be adopted if carrying out felling. A harvesting plan and associated mapping will be prepared and will include a review of the felling areas, environmental receptors – water features (including aquatic zones, relevant watercourses, hotspots, water abstraction points and crossing points), biodiversity (including hedgerows and other habitats), selection of felling and extraction system and machinery, silt and sediment control, timing, and extraction management.

Electrical Infrastructure

The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with ESB Networks.

All works in the vicinity of ESB Networks infrastructure will be carried out in ongoing consultation with ESB networks and will be in compliance with any requirements or guidelines they may have including procedures to ensure safe working practices are implemented when working near live overhead/underground electrical lines.

There is a slight chance of potential electricity outage during rerouting of the 38kV overhead line. Any outage will be kept to a minimum and any customers affected by a potential outage will be contacted prior to works commencing.

The proposed project will not result in any significant effects on grid capacity but will provide a potentially positive effect of the electricity supply infrastructure. No specific mitigation measures are proposed beyond good construction practices.

Aviation

- The developer will agree an aeronautical obstacle warning light scheme for the wind farm development with the IAA.
- The developer will provide the IAA with as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location.
- The developer will notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.

Responsibility

- Applicant
- Project Manager
- Environmental Manager
- Construction Manager

EMP 18: Invasive Species and Biosecurity

Prior to being brought onto site, all plant, equipment and PPE will have to be clean and free of soil/mud/debris or any attached plant or animal material. Prior to entering the site, all plant and equipment will be thoroughly cleaned down using a power washer unit to prevent the spread of IAS. All plant/equipment will be visually inspected to ensure all adherent material and debris has been removed.

Prior to being brought to site, certification is to be obtained from suppliers that all raw materials including soil, fill, sand, gravel and landscaping materials to be imported are free from IAS. Locations for supply e.g. quarries etc., are to be assessed for the presence of IAS prior to materials being brought to site.

All footwear/waders and/or equipment that is to be used within the aquatic environment should be treated to prevent foreign flora/fauna entering the water, and again after use, to prevent spread to other catchments.

Responsibility

- Applicant
- Project Manager
- Environmental Manager
- Construction Manager