MWP

Chapter 02 Description of the Proposed Development

Ballinla Wind Farm

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Proposed Development No.	Doc. No.	Rev.	Version	Date	Prepared By	Checked By	Approved By	Status
23882	6019			02/09/2025	CB/GT	GT	GT	Final

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2. Description of the Proposed Development

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents information on the elements that constitute the entire Proposed Development, which includes the Proposed Development, as set out in Chapter 1 of this EIAR. This chapter details the characteristics and operations involved in the Proposed Development. The purpose is to provide an appropriate level of detail to provide the basis for Environmental Impact Assessment (EIA). The chapter describes the site location, all characteristics and components of the Proposed Development and details the activities and operations required to construct, commission, and operate the wind farm development as well as decommissioning of the Proposed Development. The EIAR also assesses the proposed underground grid connection to the National Grid (the Proposed Grid Connection) as part of the overall Proposed Project.

Details of the Proposed Development are further supported by the following documents:

- EIAR Chapter 3 Civil Engineering.
- Construction Environmental Management Plan (CEMP) (EIAR Volume III, Appendix 2-1).
- Turbine Delivery Route (TDR) Assessment (EIAR Volume III, Appendix 2-2).
- Planning Application Drawings.

For the purpose of the planning application and the analysis conducted in this EIAR, the Applicant has considered seven wind turbines with a blade tip height of 185m, hardstand areas and access tracks and a 110kV substation on the wind farm site. Refer to refer to Table 2-1 and Planning Drawing No. 22156-MWP-00-00-DR-C-5401 for turbine elevation details.

2.2 Characteristics of the Proposed Development

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 TDR (the Proposed TDR), collectively herein referred to as the Proposed Development. The Proposed Development includes infrastructure and ancillary facilities and elements for construction and consideration as described below.

The Proposed Development will connect to the National Grid via 8km of underground cabling to Philipstown 110kV Substation (under construction) in County Offlay (the Proposed Grid Connection). The Proposed Grid Connection will be subject to a separate future planning application. It is assessed in this EIAR as it forms part of the overall project.

2.2.1 Proposed Development

The Proposed Development to be assessed within this EIAR consist of the following elements:

- 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 EIAR 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, and described in this chapter, have been assessed as part of this EIAR.

2.2.1.1 Duration of Permission

A ten-year planning permission is being requested for this development whereby, planning consent for the construction of the development would remain valid for ten years following the grant of permission. It is noted that the Wind Energy Development Guidelines (2006) state that "Planning Authorities may grant permission for a duration longer than 5 years if it is considered appropriate, for example, to ensure that the permission does not expire before a grid connection is granted. It is, however, the responsibility of the applicants in the first instance to request such longer durations in appropriate circumstances". This text also appears in section 7.22 of the Draft Revised Wind Energy Development Guidelines (2019).

A 10-year planning permission is considered appropriate for a development of this scale to ensure all consents required are secured to enable the construction and operation of the development.

The Applicant requests the grant of permission is on the basis of an operational period of no less than 35 years from the date of full operational commissioning of the wind farm, with permission for the onsite 110kV substation sought in perpetuity given that the substation will form part of the national electricity network. Therefore, it is envisaged that the substation will be retained as a permanent structure and will not be removed.

A separate future planning application will be submitted for the 8km grid connection.

2.2.1.2 Key Proposed Development Design Approach and Considerations

There are multiple elements which must be considered in the design of an appropriate wind farm development. Some of the key elements of the Proposed Development design approach for the Proposed Development included:

- Wind Farm Constructability.
- Environmental Constraints and Iterative Design.
- Wind Resource Zoning and Designations.

2.2.1.3 Constructability

Site conditions such as topography, hydrology, geology, and access, can affect the 'buildability' of a Proposed Development. A constructability constraint approach was used integrating the most significant construction related constraints including ground slope, peat depth and hydrology, providing a constructability ranking based on a qualitative assessment. This has been developed by Malachy Walsh and Partners (MWP), Wind Farm Engineering Team and it reflects actual site experience, and an understanding of the constraints involved in constructing and delivering wind turbine components and infrastructure. Further detail is provided in Chapter 3 Civil Engineering.

2.2.1.4 Environmental Constraints and Iterative Design

An iterative analysis approach was adopted during the Proposed Development design process based initially at a desktop level. This iterative analysis approach was then completed based on the detailed baseline studies. The approach at both desktop and baseline studies levels, included detailed constraint mapping and iterative modelling, as required, for environmental aspects. 'Mitigation by avoidance' and iterative design was a critical component of the Proposed Development design process. The objective of the iterative design process was to achieve the optimum, or the most suitable and environmentally sensitive wind farm infrastructure layout, that most complemented the particular environmental and physical characteristics of the Proposed Development site.

2.2.1.5 Wind Resource Zoning and Designations

The Offaly County Development Plan 2021 - 2027 and associated Wind Energy Strategy (WES) identifies areas of strategic regional and national importance that have the potential to accommodate wind energy development. It designates areas as being either *a) Open for Consideration for Wind Energy Developments: or b) Unsuitable for Wind Energy Developments.* As outlined below in Figure 2-1, the Proposed Development is located within an area Open for Consideration for Wind Energy Developments.

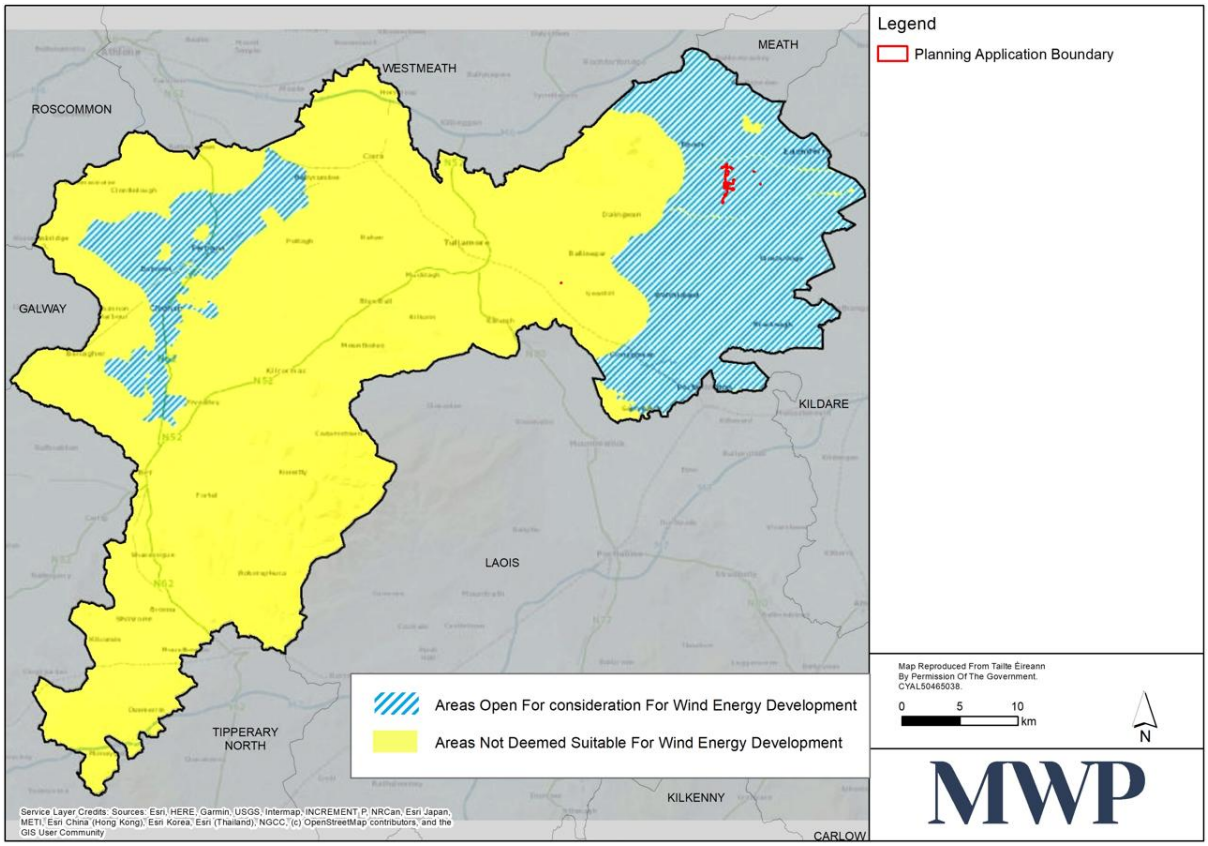

Figure 2-1: Proposed Development Wind Energy Zoning

The Offaly WES states the following regarding wind farm development in areas Open for Consideration for Wind Energy Developments:

"These areas are open for consideration for wind energy development as these areas are characterised by low housing densities, do not conflict with European or National designated sites and have the ability by virtue of their landscape characteristics to absorb wind farm developments. Notwithstanding this designation, wind farm developments in these areas will be evaluated on a case-by-case basis subject to criteria listed in Development Management Standard 109 contained in Chapter 13 of Volume 1 of this County Development Plan and the Section 28 Wind Energy Development Guidelines".

The WES states that the site is in Area 1 (area generally north of Rhode). The area is described as follows:

"This area is characterised by significant tracts of peatlands and improved agricultural land to the north of the village and large landholdings. In addition, there exists a precedent of windfarm and renewable energy projects being deemed suitable while there exists both good wind speeds and electricity infrastructure in the area. There is sensitivity in relation to views of Croghan Hill to the north and west which can be mitigated by suitable layout minimising visual conflict or compromising this focal feature in the area by considering the clustering of turbines and adequate separation of turbines from the vista of Croghan Hill from Rhode village".

2.2.2 Development Location

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 2-2 outlines the location of the Proposed Wind Farm and Proposed Grid Connection Route, the area within this 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.

The Proposed TDR is outlined in Figure 2-11 and Appendix 2-2.

Existing land cover at the site consists of agricultural land in the northern section and coniferous commercial forest in the southern section. The northern and southern sections of the Proposed Wind Farm are split 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.

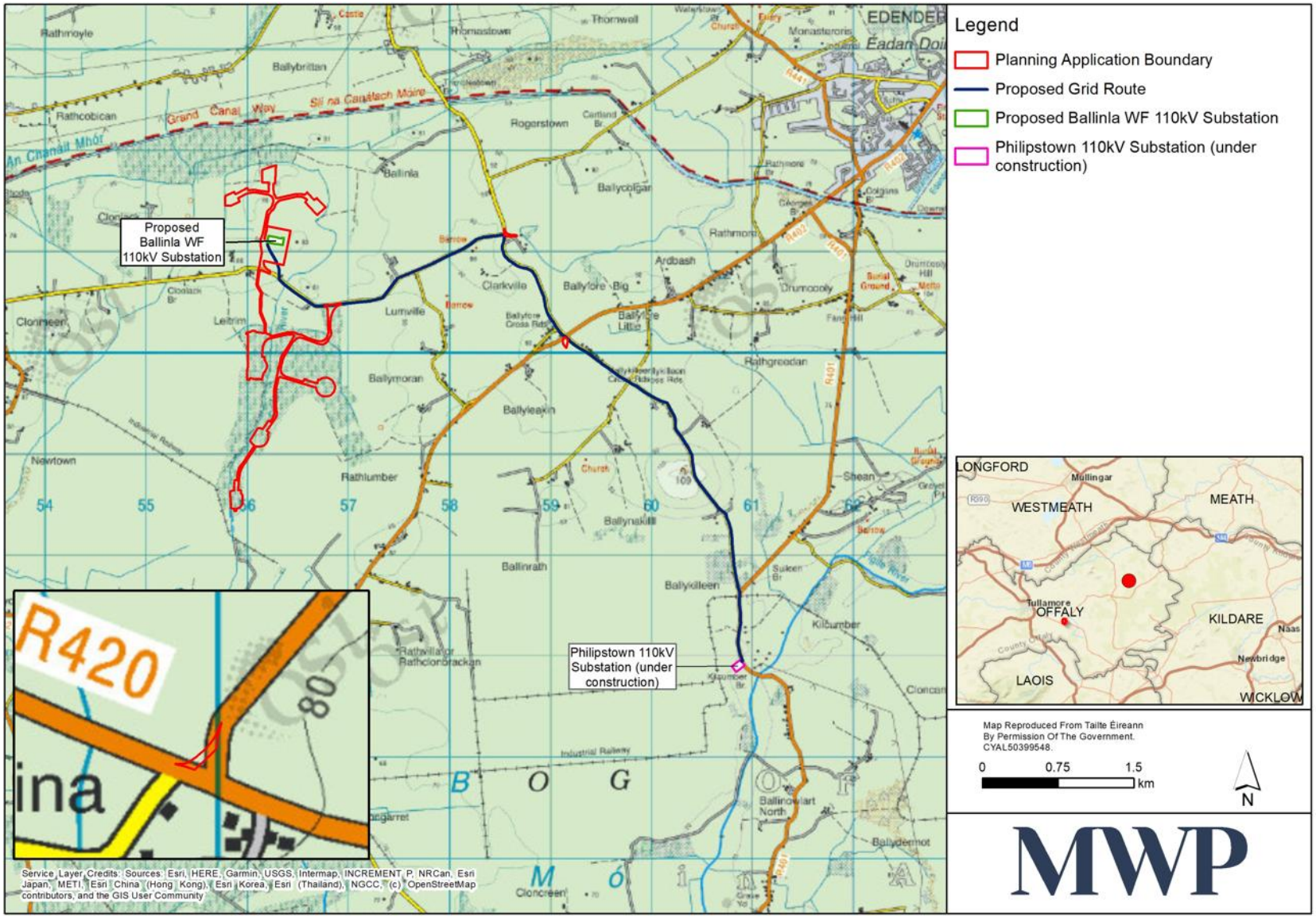

Figure 2-2: Site Location and Red Line Boundary of the Proposed Development

2.2.2.1 Proposed Development/Study Area and Planning Application Area

The Proposed Development boundary (the red line) includes a total land area of approximately **42 ha** (see **Figure 2-3**). During the Proposed Development EIA scoping, landowner engagement and design process, the wider study area was examined for wind turbine suitability and potential environmental impacts. The Proposed Development area was substantially reduced in size, eliminating areas that were considered unsuitable, thereby concentrating on areas that were deemed appropriate for locating wind turbines and associated infrastructure. Therefore, the study area for the wind farm element (see also **Figure 2-3,** the yellow line) which is referred to in the figures throughout this EIAR, incorporates a larger assessment area than presented in the planning application drawings. The overall EIA Study Area is based on all elements of the proposed project including the grid connection, TDR, the planning boundary and adjacent lands. The main EIA Study Area, zones of influence and sensitive receptors will vary depending on the assessment being completed for the EIA. This is reflected accordingly in each chapter. **Figure 2-4** illustrates the Proposed Project boundary and relevant townlands.

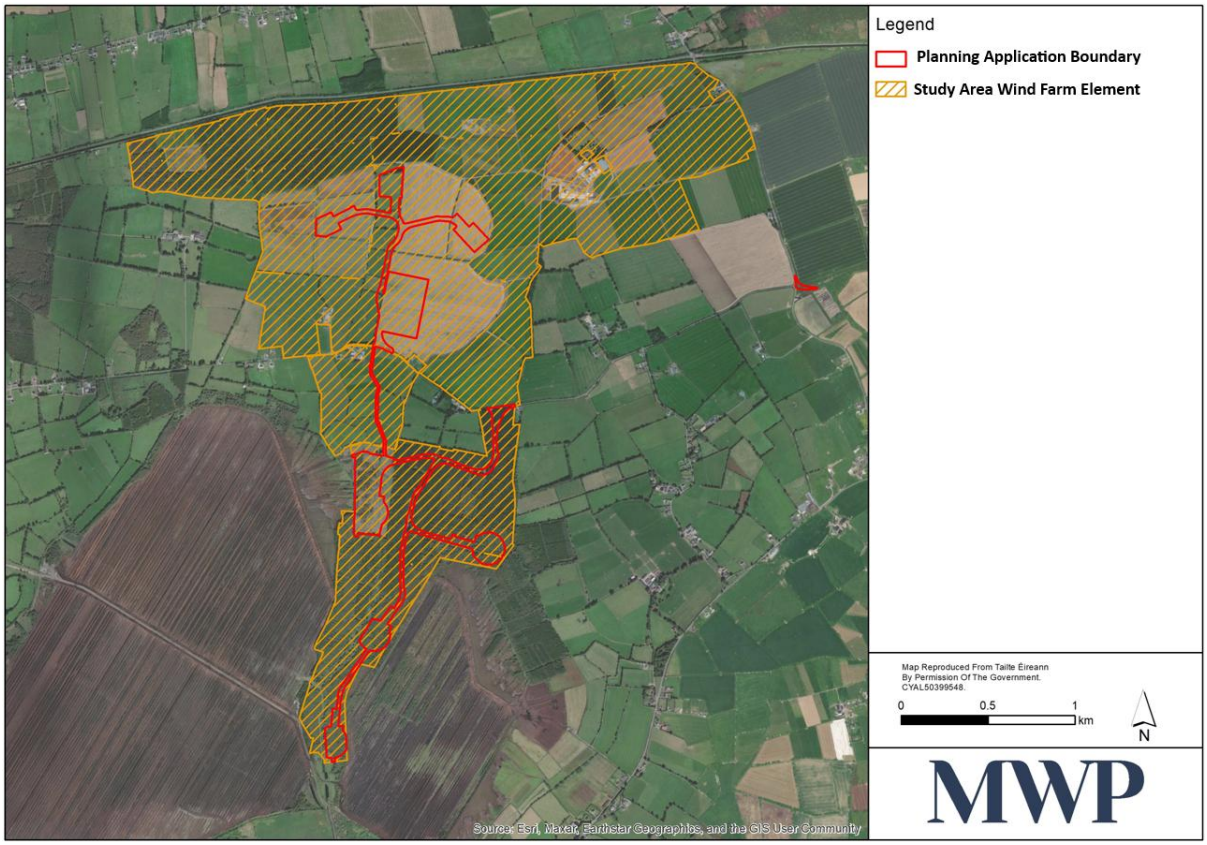

Figure 2-3: EIA study area of the wind farm element of the proposed development

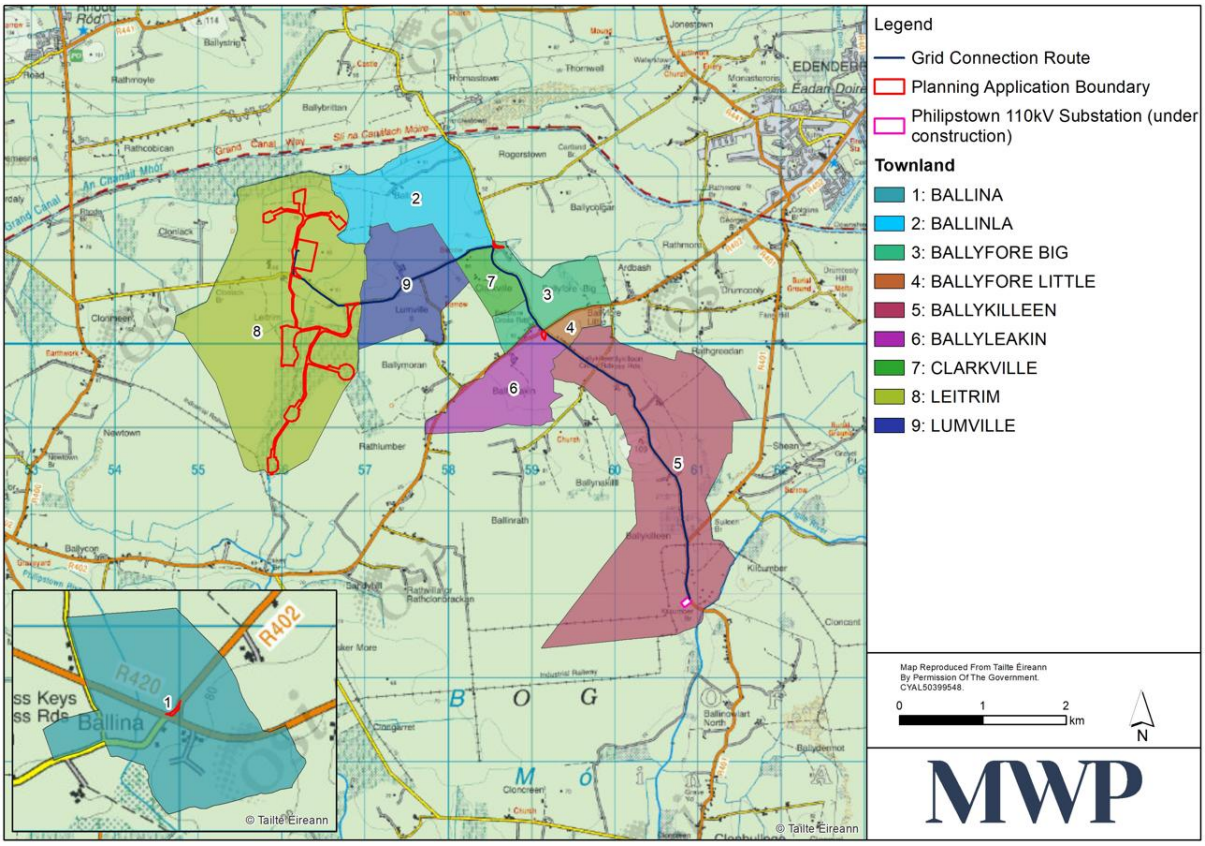

Figure 2-4: Site Boundary and Townlands

2.2.3 Development Lands Ownership

The lands within the Proposed Development are owned by a number of different private landowners and one semi state body. The lands consist of agricultural farmland and commercial forestry plantation as described in the previous sections. Consent letters from all landowners are included with the planning application.

A local road (L5010) transects the middle of the Proposed Wind Farm. This local road links the L5006 to the east of the Proposed Wind Farm with the R400 to the west. Road opening licences will be sought from Offaly County Council (OCC) for any development works within and along the public road network.

2.3 Size, Design and Appearance of the Proposed Development

The figures presented in the following sections are for illustrative purposes only.

Figure 2-2 outlines the Proposed Development site boundary included in the planning application along with the Proposed Grid Connection. The area within the Proposed Development red line boundary is 42ha.

Figure 2-6 shows the site layout for the Proposed Wind Farm and illustrates the positions of the turbines, access tracks, crane hardstand areas, substation compound, spoil deposition area and temporary construction compound.

The Proposed Wind Farm layout reflects the outcome of the iterative engineering and environmental analysis, and design approach adopted which included minimising key risks in terms of ground conditions, potential negative influences on the existing drainage, avoidance of sensitive ecological habitats, and any known

archaeological features, as well as a myriad other considerations. This design process, rationale and evolution is described in EIAR Volume II Chapter 4 Alternatives.

Additional temporary works will be required to facilitate the delivery of the turbine components along the public road network. These are outlined in the Turbine Delivery Report (Appendix 2-2). A road opening licence will be sought and agreed with the relevant local authority for any works required within the public road network.

To facilitate construction, there will be a requirement for tree felling within the Proposed Development. A felling licence will be sought for any felling required within the Proposed Development boundary. Any forestry felled as a part of the Proposed Development will be replaced in line with the felling licence.

Consequently, replacement forestry lands will need to be identified and replanted. However, it is envisaged that these lands will be at a significant remove from the Proposed Development, therefore no cumulative impact with the Proposed Development is expected. These lands will be subject to a separate independent technical and environmental assessment, and related consenting process. This process consists of a licence from the Minister for Agriculture, Food and the Marine, in line with the Forestry Act 2014, and the assessment procedures therein.

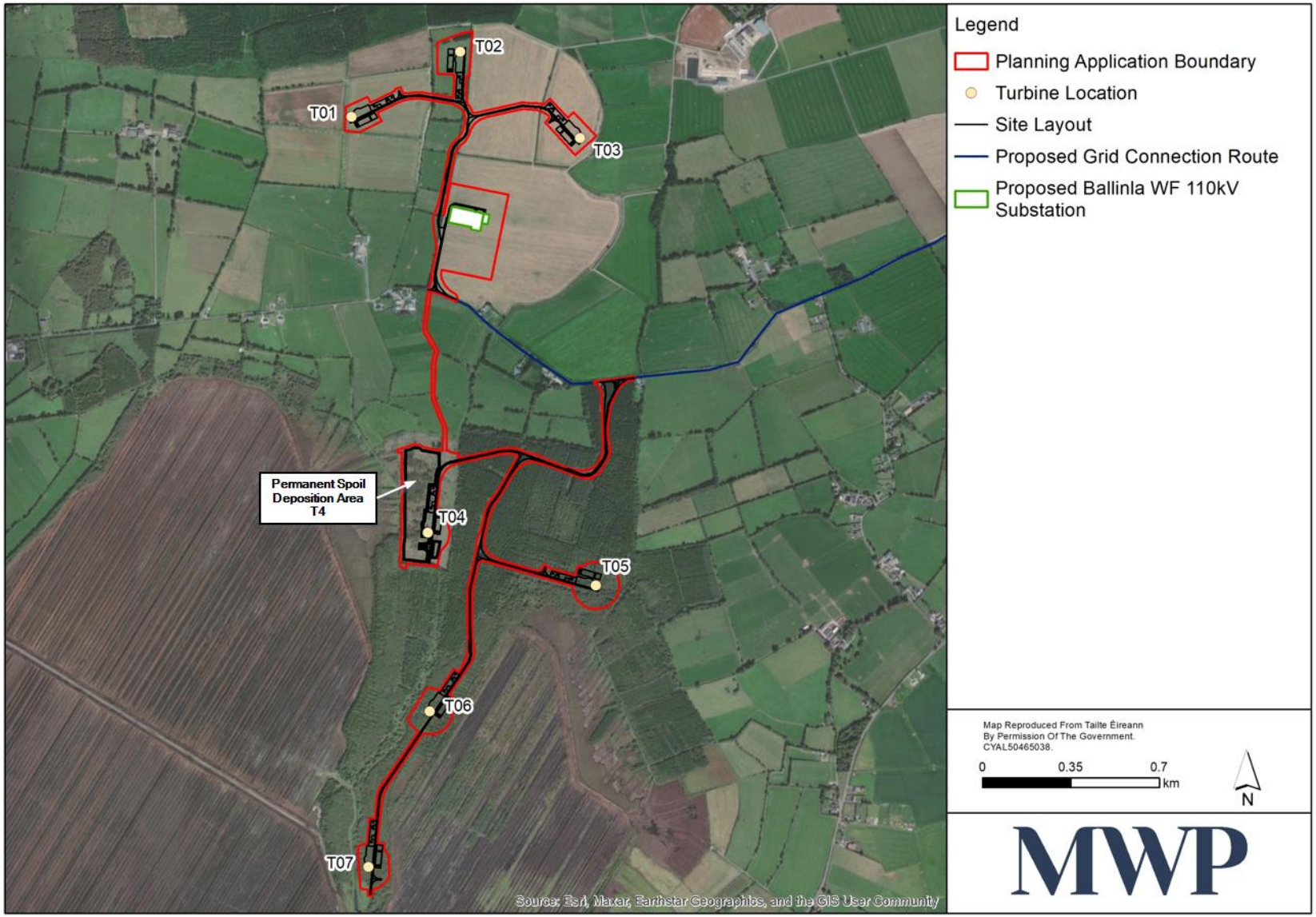

Figure 2-5: Proposed Wind Farm Layout

2.3.1 Proposed Wind Farm Layout Wind Turbines

It is proposed to install seven wind turbines each with a tip height of 185 metres (refer to Table 2-1 for specific turbine dimension details), T1 to T7. Refer to Planning Drawing No. 23882-MWP-00-00-DR-C-5401 for turbine elevation details.

The turbine selected will be certified under the International Electrotechnical Commission IEC 61400-1 safety standards and will be designed to withstand the environmental conditions encountered on site. The proposed turbines will be of a typical modern design, incorporating tubular towers and three blades attached to a nacelle. The tower supports a nacelle and rotor hub. Commercial wind turbine hubs and towers are typically made of steel, while the blades can be made of a matrix of glass-fibre reinforced polyester or wood-epoxy or a similar composite material. Requirements for the finish and colour are detailed in the 2006 Department of Environment, Heritage and Local Government Wind Farm Development Guidelines as follows:

- Turbines shall be finished to a white, off-white, or grey colour to correspond with the colour scheme of existing turbines.
- All surfaces will have a matt non-reflective finish.

It is proposed to install lighting on the turbines in a pattern that is acceptable to the Irish Aviation Authority/AirNav Ireland for aviation visibility purposes. The dimensions and co-ordinates of the proposed turbines are set out in Table 2-1.

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)

2.3.2 Wind Turbine Foundations

Each wind turbine will have a reinforced concrete base pad foundation with a central plinth above the base, which will support the tower. See planning application Drawing No. 23882-MWP-00-00-DR-C-5402 for foundation details. Regarding decommissioning, the turbine foundation will be covered over and allowed to revegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option, as to remove the reinforced concrete associated with each turbine would result in environmental disturbances such as noise, vibration and dust.

2.3.3 Hardstands and Lay Down Areas

Turbine hardstands are required to accommodate the delivery of the turbine components prior to their assembly and to support the cranes during turbine erection. Each wind turbine will have an associated turbine hardstand area adjacent to the foundation approximately 80m long by 30m wide. Temporary set down areas will be formed to facilitate the storage of the turbine components prior to assembly and erection at each crane hardstand. The hardstand areas will be excavated and bear onto rock (or other suitable bearing stratum) with a foundation of approximately 0.5m to 1.5m depending on the local bedrock profile. Following construction, the temporary hardstand areas will be covered over and allowed to re-vegetate naturally. Regarding decommissioning, leaving the hardstands in situ and revegetating is considered a more environmentally sensible option, as to remove the hardstands would result in environmental disturbances such as noise, dust and an excavation CO_2 footprint. See planning application **Drawing No. 23882-MWP-00-00-DR-C-5403** and **Chapter 3 Engineering Section 3.5.2** for full hardstand details.

2.3.4 Permanent LiDAR Station

A permanent LiDAR station will be installed within the wind farm substation compound to monitor the local wind regime while the wind farm is in operation. The station will have a base foundation and galvanised steel palisade fence, c. 2.4m in height. An example of a LiDAR station is shown in **Plate 2-1**. See planning application **Drawing No. 23882-MWP-00-00-DR-C-5404** for details.

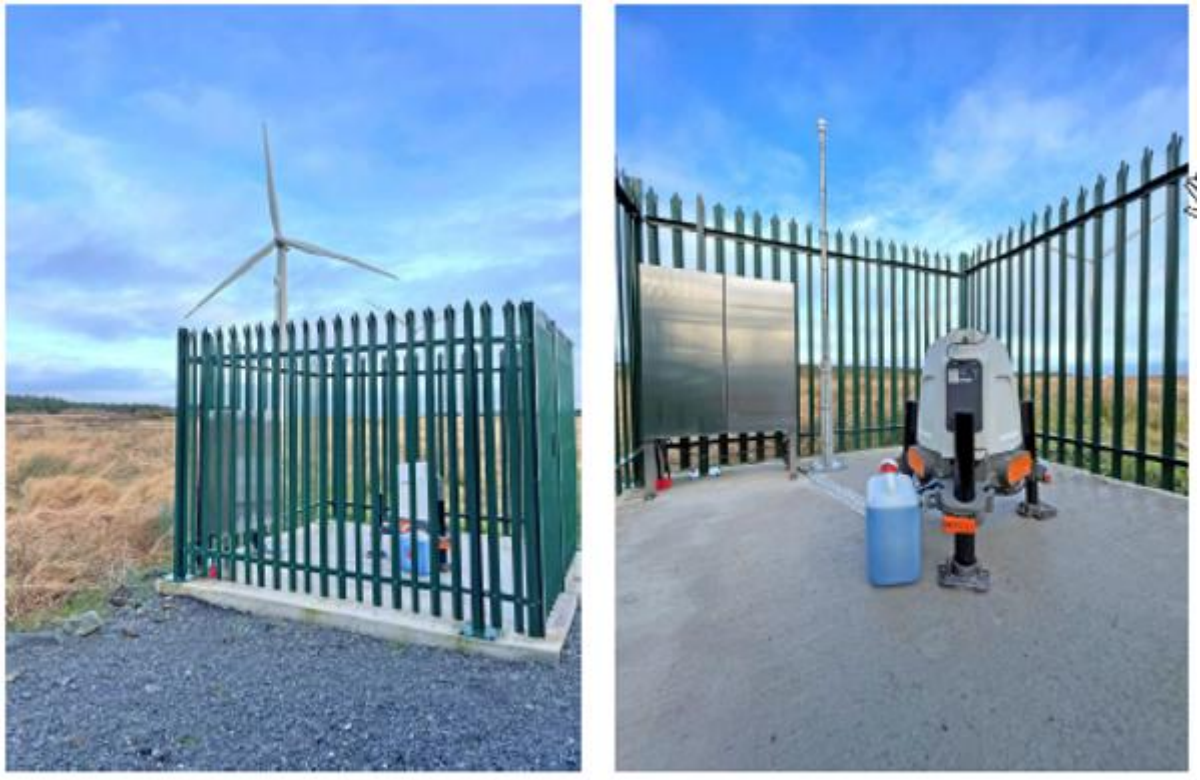

Plate 2-1: LiDAR station on a wind farm

2.3.5 Underground Cabling within the Wind Farm Site

A network of underground cables serving each turbine with electrical power, signal transmission and collecting the generated power (collector cable), will be installed along the internal access tracks connecting the turbines

to the substation compound. There will be no overhead power lines constructed on the site. The collector cable will link the turbines to the proposed 110kV substation and will also link the northern cluster and the southern cluster of turbines. The collector cable will diagonally cross the L5010 when connecting the turbines. These cables will be a combination of in the verge and in the access track cables.

2.3.6 Internal Site Access 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 2-5. 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-5405 for details. The methods of construction are outlined in EIAR Chapter 3 Civil Engineering.

2.3.7 Site Access

Primary access to the Proposed Wind Farm will be provided from the local public road (L5010), which links the L-5006 in the east and the R400 to the west. (refer to Figure 2-6). There will be two site entrances, one each to facilitate the northern and southern sections of the site.

Haul roads to the Proposed Development will utilise the local and regional road network. There will be no access to the Proposed Wind Farm for deliveries on the L5006 from the north. This is to reduce impact on the road network at the Trimblestown Bridge which is a narrow blind humpback bridge over the Grand Canal.

Entrance Point 2 on the L-5010 will serve the northern portion of the site and internal tracks to T1, T2, T3 and the substation. Entrance Point 1 will be created on the same L-5010 local road and will serve the southern portion of the site and internal tracks to T4, T5, T6 and T7. 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 wind farm enters the operational phase.

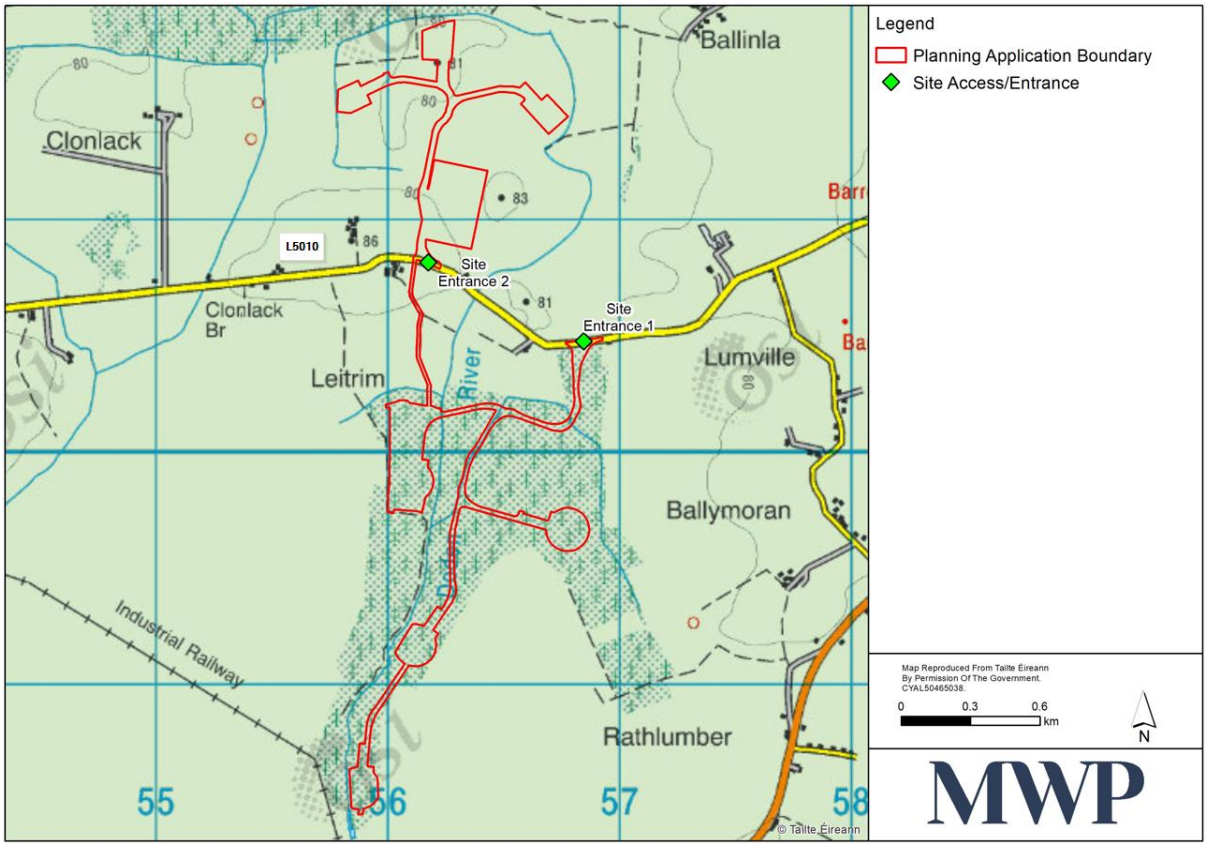

Figure 2-6: Site Entrances off L5010

2.3.8 Turbine Delivery

All turbine components for the Proposed Development will arrive at one of Irelands 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. A description of both proposed routes is provided below, and an overview of the proposed section is shown in **Figure 2-7**.

Turbine Blades

- Exit M6 at Junction 5.
- M6/N52 roundabout, exit traveling south.
- N52/R443 roundabout, exit travelling southeast on N52.
- N52/L2025 roundabout, exit travelling east on L2025.
- Continue east along L2025 through Cappincur, Clonmore and Toberleheen.
- L2025/R402 junction at Ballinagar, exit travelling northeast on R402.
- Continue northeast along R402 through Knockballyboy and Derrygowley.
- R402 junction at Daingean, continue east on R402.
- Continue east along R402 through Ballyhugh/Springfield, Killeenmore and Bogtown.

- R402/Local Road at Ballyfore, exit travelling north on local road.
- Local road junction 3-point turn to turn the blade vehicle west on L5010 towards Leitrim townland.
- Site entrances located approximately 2km and 2.7km along the L5010 to the south and north shoulders of the road respectively.

Turbine Tower Sections

- Exit M6 at Junction 5.
- M6/N52 roundabout, exit traveling south.
- N52/R443 roundabout, exit travelling southeast on N52.
- N52/L2025 roundabout, exit travelling south on N52.
- N52/R420 roundabout, exit travelling southeast on R420.
- Continue southeast along R420 through Meelaghans.
- R420/R402 junction at Ballina, exit travelling northeast on R420.
- Continue northeast along R402 through Ballymooney.
- L2025/R402 junction at Ballinagar, exit travelling northeast on R402.
- Continue northeast along R402 through Knockballyboy and Derrygowley.
- R402 junction at Daingean, continue east on R402.
- Continue east along R402 through Ballyhugh/Springfield, Killeenmore and Bogtown.
- R402/Local Road at Ballyfore, exit travelling north on local road.
- Local road junction 3-point turn to turn the blade vehicle west on L5010 towards Leitrim townland.
- Site entrances located approximately 2km and 2.7km along the L5010 to the south and north shoulders of the road respectively.

The Turbine Delivery Assessment Report is available in Appendix 2-2.

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, lampposts, 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. Hedge/tree cutting and local road widening are assessed where applicable in the relevant chapters of this EIAR.

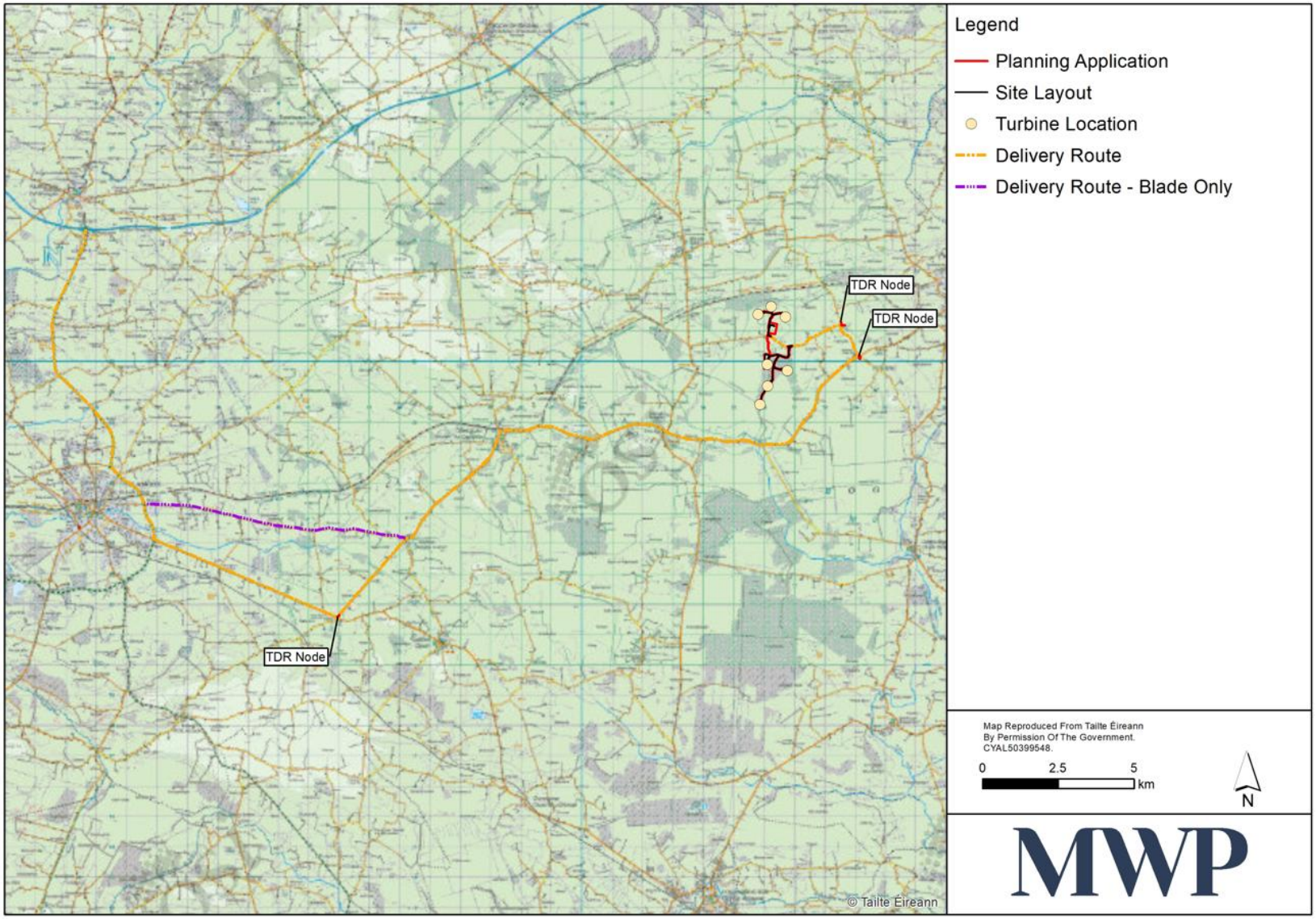

Figure 2-7: Proposed TDR from Primary Network (M6) to Proposed Wind Farm

2.3.9 Traffic Management

All reasonable efforts will be made to minimise the impact of the works on local residences and users of the public road networks. 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 and delivery of the wind turbine components is included as **Appendix 15.** In the event ABP decides to grant approval for the Proposed Development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the consenting authority. The TMP will be updated prior to construction of the Proposed Development to ensure all necessary controls are in place. All suppliers and contractors coming to and working on the Proposed Development site will be made aware of the TMP and measures to be implemented.

2.3.10 Temporary Construction Compounds and Welfare Facilities

One temporary construction compound will be established upon commencement of the construction phase. The temporary compound layout is shown in **Figure 2-8**, refer to planning application **Drawing No. 23882-MWP-00-00-DR-C-5411** for details. The construction compound will be immediately south and adjacent to the proposed 110kV substation, as shown in **Figure 2-5.**

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 temporary compound will include an enclosed wastewater management system 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 Proposed Development the compound will be decommissioned by backfilling the area with the material arising during excavation and landscaping with topsoil.

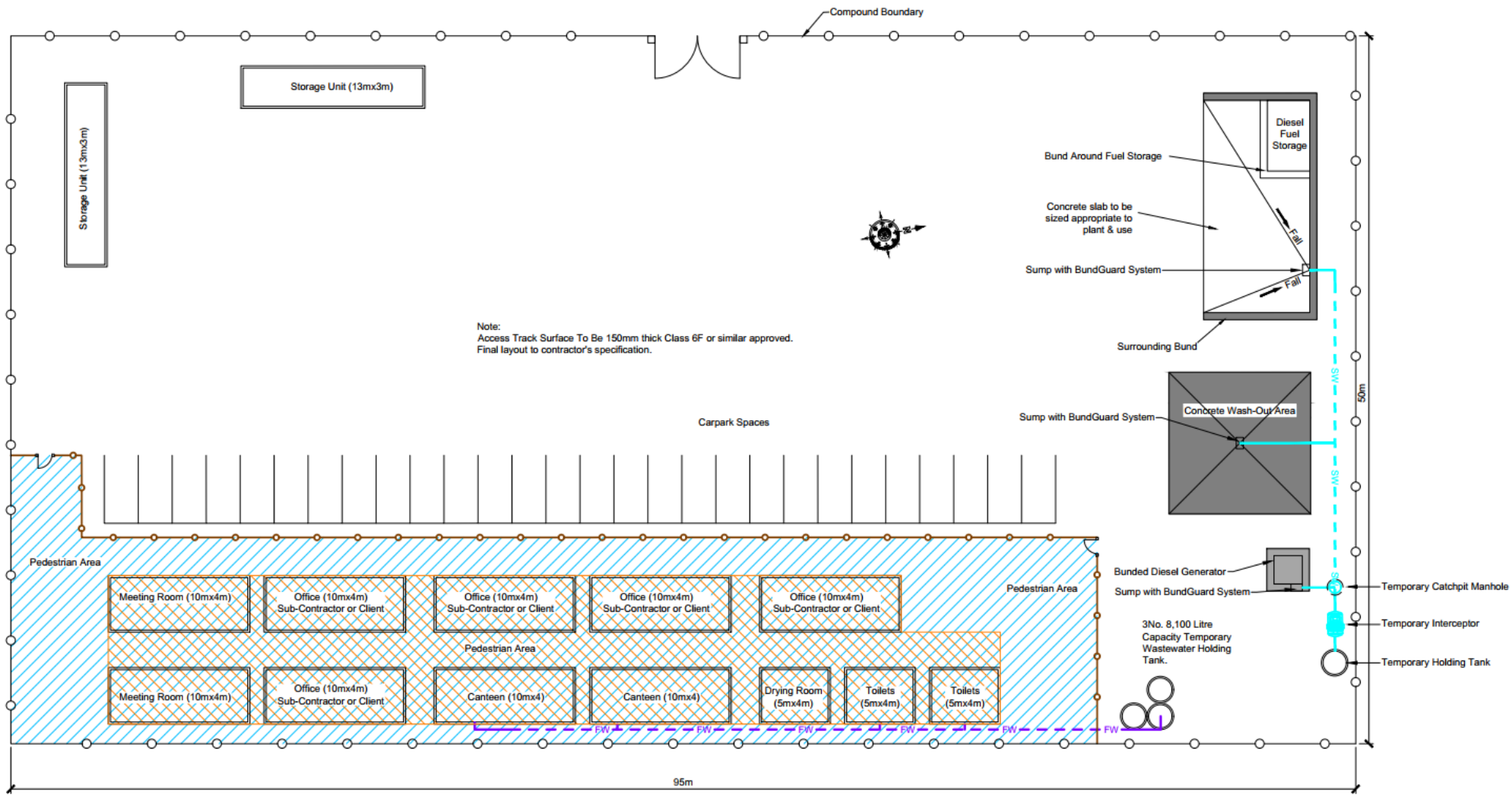

Figure 2-8: Temporary Construction Compound

2.3.11 Spoil Deposition Area

Excavated Soils and Rock

It has been calculated that there will be approximately 84,700m³ of material excavated during the construction of the Proposed Development. Subsoil and topsoil will be reused on site where possible for reinstatement and soft landscaping purposes. It has been calculated that there will be an excess of subsoil excavated during the construction stage. This material will be mainly made up of the peat soils from the southern section of the site that will be excavated for the wind farm infrastructure. There is one proposed permanent soil deposition area located at T4 for surplus material, as shown in **Figure 2-5.**

The spoil deposition area is a commercially forested area that will be cleared to accommodate T4. The spoil deposition area will have an engineered slope, so that peat slippage will not occur. The engineered slope will encircle the area to contain the peat and other subsoils used within the berm. The location of the proposed spoil deposition area is shown in **Figure 2-9**.

See planning application **Drawing No. 23882-MWP-00-00-DR-C-5035** for more details.

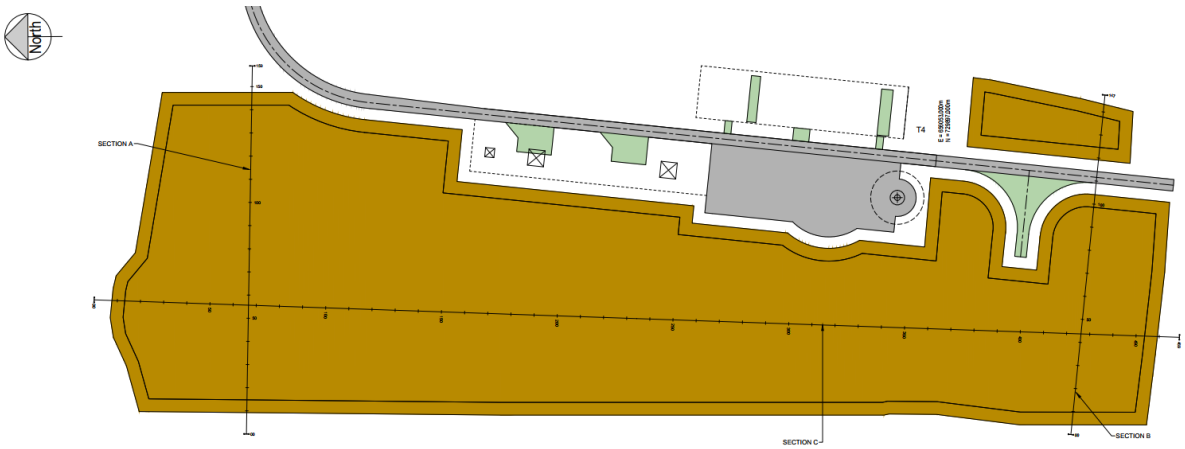

Figure 2-9: Spoil Deposition Area at T4. Excerpt from Planning Drawing 23882-MWP-00-00-DR-C-5035

2.3.12 Surface Water Management

A surface water management system will be constructed on the Proposed Wind Farm so as to attenuate run-off, guard against soil erosion and safeguard downstream water quality. The drainage system will be implemented along all work areas including all internal site access tracks, storage areas, crane hardstand areas and the temporary site construction compound. Details of the proposed site drainage system are described in **Chapter 3 Civil Engineering** of the EIAR. The surface water management system is designed to take the impacts during the construction phase. During the operational phase the system will remain in place with settlement ponds adding to biodiversity.

The following gives an outline of the drainage management arrangements proposed along the internal access tracks:

- A surface water run-off drainage system will be implemented along all internal access tracks, to separate and collect 'dirty water' run-off from the track and to intercept clean over land surface water flows from crossing internal tracks.
- To achieve separation, clean water drains will be positioned on the upslope and dirty water drains positioned on the downslope of tracks, with track surfaces sloped towards dirty drains.
- Dirty drains will lead to settlement ponds which will then lead to an overland discharge of stormwater.
- Clean water will be piped under both the access tracks and downslope collection drains to avoid contamination. Piping the clean water under the access track allows the clean water to follow the course it would have taken before construction, thus mimicking the existing surface water over land flow pattern of the site and therefore not altering the natural existing hydrological regime on site.
- 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.

See planning application **Drawing No. 23882-MWP-00-00-DR-C-5019** to **23882-MWP-00-00-DR-C-5031** for drainage details.

To manage surface water during temporary localized road widening works at the identified nodes along the Proposed TDR, targeted drainage controls will be implemented to minimize runoff and sediment transport. These short-term interventions, typically involving verge stripping, minor excavation, and temporary surfacing, will include the installation of shallow cut-off drains and temporary interceptor channels to divert surface water away from construction zones. All temporary drainage features will be designed to accommodate anticipated rainfall during the construction window and will be removed or reinstated upon completion of the widening works, ensuring no long-term alteration to existing hydrological pathways.

2.3.12.1 Water Course Crossings

Watercourses Within the Proposed Wind Farm

As part of the Proposed Development, four watercourse crossings will be required on EPA registered watercourse (EPA River Water Body Code: IE_SE_14E010200). The water crossings will consist of one clear span bridge and three culverts.

Land Drains within the Proposed Wind Farm

In the northern section of the Proposed Wind Farm, 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 Proposed 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 box culverts.

Watercourses within the Proposed Grid Connection

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.

Refer to **Chapter 3 Civil Engineering** of the **EIAR** for the details on watercourse crossings. The potential methodologies that will be used include trench and ducting, culverts and horizontal directional drilling.

2.3.13 Commercial Tree Felling

Felling of commercial conifer and mixed broadleaf and conifer forestry will be required to accommodate the construction of some wind farm infrastructure, namely four turbine foundations, and associated hardstands, access tracks, turbine assembly, and spoil deposition area. It is proposed to fell around turbines both to facilitate construction and as a mitigation measure for bats as per best practice guidance and local specific biodiversity requirements. Overall felling of approximately 21ha of forestry will be required (see Figure 2-10). The areas to be felled are outlined in planning drawing 23882-MWP-00-00-DR-C-5034.

All tree felling will be undertaken in accordance with a tree felling licence, using good working practices as outlined by the Department of Agriculture, Food, and the Marine (DAFM) Standards for Felling and Reforestation (2019) and will follow the specifications set out in Forest Service's 'Forestry and Water Quality Guidelines' (2000) and 'Forest Harvesting and Environmental Guidelines' (2000). These standards deal with sensitive areas, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel, and machine oils. All conditions associated with the felling licence will be complied with. A felling licence application will only be submitted if planning permission is received for the Proposed Development.

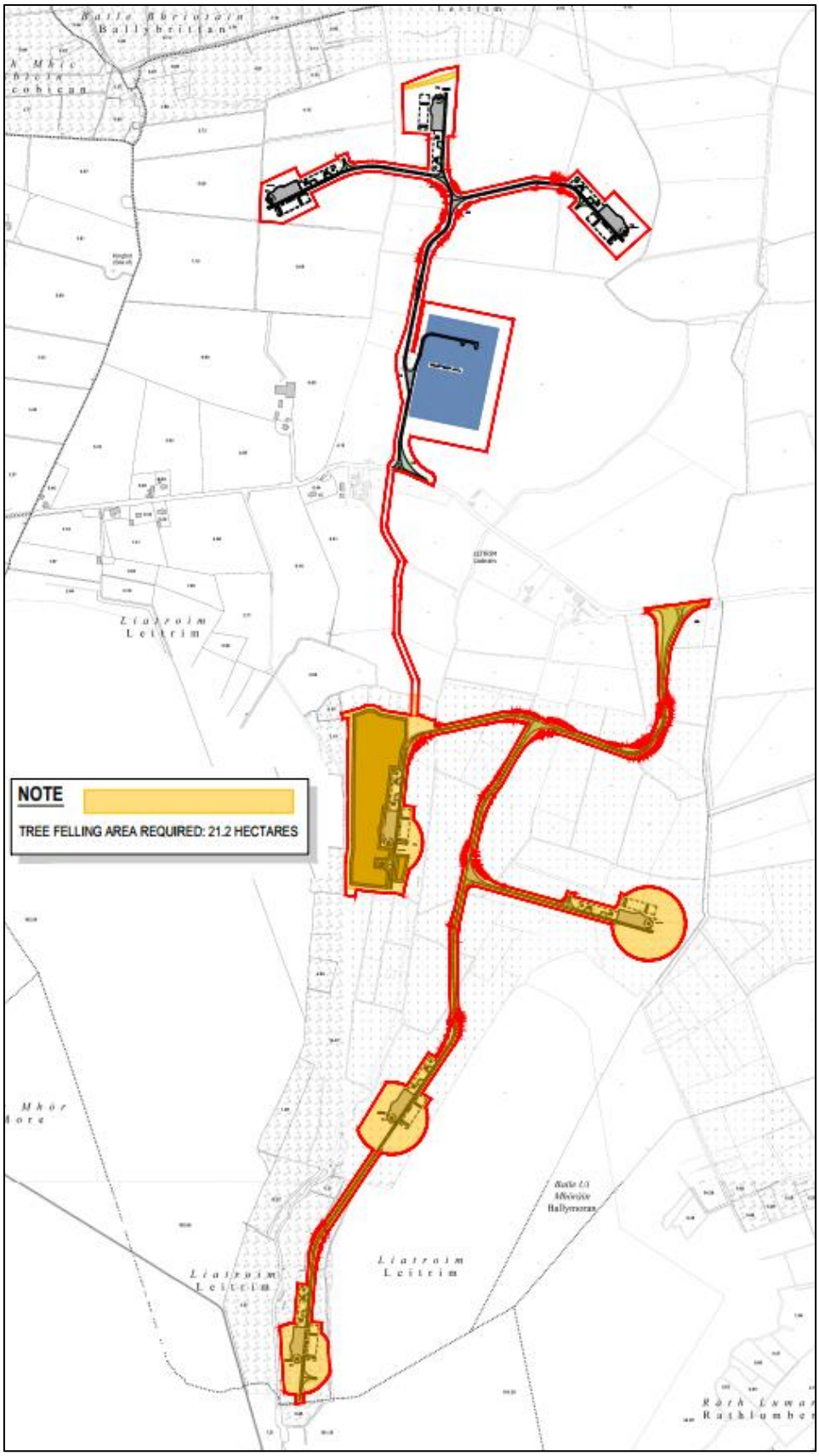

Figure 2-10: Area to be Felled (Excerpt from Planning Drawing 23882-MWP-00-00-DR-C-5034

2.3.14 Replant Lands

If commercial forestry is felled within the state and it is not intended to replant at the same location, alternative afforestation lands must be found which are equal in area to that which was felled. Replanting of forestry within the Proposed Development site will not be done. The replant lands will be found off site as part of the felling licence process. Replacement replanting of forestry in Ireland is subject to license in compliance with the Forestry Act 2014 as amended. The consent for such replanting is covered by the Forestry Regulations 2017 (S.I. No. 191 of 2017). The total amount of felling proposed for the Proposed Development is approximately 21ha. The afforestation of alternative lands equivalent in area to those lands being permanently clearfelled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. The Applicant commits to not commencing the Proposed Development until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

2.3.15 Proposed Grid Connection

While subject to a separate planning application, the Proposed Grid Connection to the National Grid has also been assessed as part of this EIAR.

A 110kV underground cable will be trenched into the road or the verge of the public road. The Proposed Grid Connection will travel from the proposed 110kV substation along the access tracks for approximately 0.5km to the L5010. On the L5010 the underground cable will then travels east for approximately 2km to the L5006. On the L5006 the UGC will progress 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 Proposed Grid Connection is shown in Figure 2-2. The full length of the grid connection is approximately 8km.

The Proposed grid connection as approximately 18 watercourse crossings, one is and EPA registered stream and the others are land drains. The potential crossing methodologies include trench and ducting, culverts and horizontal directional drilling.

2.3.16 Electrical Substation and Operations Compound

The proposed 110kV electrical substation and compound will comprise an outdoor electrical yard and two single storey buildings (one for EirGrid and one for the wind farm operator). The EirGrid building will contain a control room, storeroom, office/canteen and a toilet. The wind farm operator building (or Independent Power Provider (IPP) substation building) will contain a storeroom, communications room, control room, staff room, office, switchgear room and a toilet. Both substation buildings will be approximately 8.66m in height, with pitched roofs and external blockwork with plastered finish. There will be a very small water requirement for toilet flushing and hand washing and therefore it is proposed to harvest water from the roofs of the buildings. The discharge from the toilet within each building will go to a holding tank located within the substation compound where the effluent will be temporarily stored and removed at regular intervals by an approved contractor. Potable water will be achieved either through treatment of the rainwater harvesting system or through water delivery. Parking for each building will be located within the compound area. The substation buildings and associated compound will be contained within a 2.6m high galvanised steel palisade fence. It is proposed to topsoil and revegetate the cut and fill slopes required for the substation site.

The proposed operations compound is adjacent to the IPP substation and consists of three 40ft storage containers and a wheelie bin/skip area for operational waste management.

Layout drawings of the proposed substation compound and buildings are in Drawings No. MWP 23882-DR-00-00-DR-C-5417 to 23882-MWP-00-00-DR-C-5425 for details.

2.3.17 Turbine Transformers

Each individual turbine will generate electricity at a nominal voltage. Each turbine will also have its own transformer to step-up to an onsite distribution voltage. The transformer and associated switchgear will be located within the turbine tower. The maximum export capacity of each turbine will be approximately 7.2 megawatt (MW).

2.3.18 Communication Links

There will be communication links between the wind turbines, LiDAR station, and the substation. The links will use ducted fibre optic cables laid in the same trench as the network of underground electrical cables around the site.

2.3.19 Cumulation with Other Existing and/or Approved Planned Developments

The Proposed Development, consisting of all elements, including the wind farm, substation, underground grid connection and turbine delivery route have been assessed as a whole. The Proposed Development was considered in combination with other plans and planned developments that could result in cumulative effects. including:

- Offaly County Wind Energy Strategy (2021 - 2027).
- Offaly County Development Plan 2021-2027.

Any developments under these plans will first have to be consented under planning and development legislation. Significant cumulative impacts are not predicted with the plans listed above, as each plan has a range of environmental and natural heritage policy safeguards in place. Furthermore, this Proposed Project has been developed in view of achieving the objectives of these plans. Therefore, the development of this Proposed Development in combination with the scope of works required to achieve the objectives of these plans will not result in cumulative effects.

In terms of the Proposed Development, the zoning in the county development plan relates to wind energy development and there is no other contradictory zoning for other Proposed Development types or infrastructure. In terms of the Offaly County Wind Energy Strategy, the area where the Proposed Development is to be located is deemed ‘Open for consideration for Wind Energy development’.

The material for the cumulative assessment was gathered through a search of relevant County Councils’ Online Planning Registers, the ABP website and the EIA Portal. A review of applications for the preceding five years was carried out during the EIA process. The search focused on the townlands common to the Proposed Development. All other wind farm developments were considered within 25km of the site. Finally, recent planning applications that are pending a decision from the planning authorities, which were accompanied by an EIAR, were also considered. The planned developments in the surrounding areas mostly relate to small scale development including agricultural sheds and shed extensions, dwelling houses, and extensions to dwelling houses, attic conversions, domestic wastewater treatment systems, installation of photovoltaic for domestic purposes, garages, demolitions, and retention permission applications etc. A final search in relation to planned developments was undertaken on the 2nd September 2025.

Such minor domestic and agricultural development will not introduce cumulative effects. These minor planned developments are either under the threshold for EIA or excluded from the list of planned developments requiring EIA and due to the nature and scale of these applications would not introduce complex or significant issues, therefore; they are not considered in the cumulative assessment.

Larger scale planned developments within 25km of the Proposed Development are included in Table 2-2. The most relevant applications relate to the expansion of Ballinla Farm within the subject site. The remaining developments are ancillary applications for nearby wind farms or Edenderry Power Station.

The permission for the construction of an A-roof agricultural building to include a milking parlour/calf rearing pen, feed storage, cow collecting yard, cubicle sheds, silage pit, slurry lagoon and associated site works was granted on 11th July 2021. The development was sub-threshold EIA. Considering the scale of the development it is very unlikely to introduce significant cumulative effects.

Land management practices in the wider area which are considered in combination with the effects of the Proposed Project are agriculture and forestry. It is proposed that all agricultural activities within the planning boundary will cease for the duration of the construction and commissioning phase. Agricultural activities within the wider study area will continue and will be separated from construction activities by appropriate stock proof fencing. Forestry operations within the planning boundary (apart from the operations required for the development) will also cease and will resume again post commissioning of the wind farm.

In terms of the replacement forestry lands, there is no potential for significant cumulative effects associated with the site and forestry operations. The Applicant commits that the location of any replanting (alternative afforestation) associated with the Proposed Development will be at a distance to not create any potential cumulate effects and also outside any potential pathways of connectivity with the Proposed Development. This will ensure that there is no potential cumulative effect associated with this replanting.

Table 2-2: Planning Applications in the Area

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) The completion of the capping of cells 5 over an area of 24,009m2 and cell 6 over an area of 23,752m2 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 35,000m2 and area no. 2 covers an area up to 15,000m2. 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.	Cloncreen, Clonbullogue, Co. Offaly	Granted, Conditional 14/04/2022
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

Planning Ref.	Applicant	Description		Planning Authority Decision
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 permitted Cushaling Wind Farm substation 25 meters southwest	Ballykilleen, Co. Offaly	Granted, Conditional 28/03/2023
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, 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	Clonin, Rhode, Co. Offaly	Granted 07/03/2017
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	Bord Na Móna lands within County Offaly	Lodged 08/04/2025 Live case

Planning Ref.	Applicant	Description		Planning Authority Decision
		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.		
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

2.3.19.1 Other Wind Farm Developments

The potential cumulative impact of the Proposed Development has been assessed in accordance with Annex IV of the EIA Directive as amended which provides that the EIAR must contain a description of the likely significant effects of the Proposed Development on the environment resulting from the cumulation of effects with other existing and/or approved planned developments, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

The 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 Development are listed below and illustrated in Figure 2-11.

- Cushaling Wind Farm (9- turbine) (Permitted and under construction).
- Cloncreen Wind Farm (21 - turbine) (existing).
- Mountlucas Wind Farm (28 - turbine) (existing).
- Yellow River Wind Farm (29 – turbine) (Permitted and under construction).
- Moanvane Wind Farm (12 – turbine) (Permitted and under construction).
- Dernacart Wind Farm, Co. Laois (8 – turbine) (Permitted)
- Drehid Wind Farm, Co. Kildare (11 turbines) (Planned for submission)

Other wind farms in planning that were also considered in cumulative effects, where relevant, are;

- Ballivor Wind Farm, Co. Meath and Co. Westmeath (Permitted)
- Clonarrow Wind Farm, Co. Offaly (Under FI request in planning)

The potential for cumulative effects is considered in the relevant chapters of this EIAR.

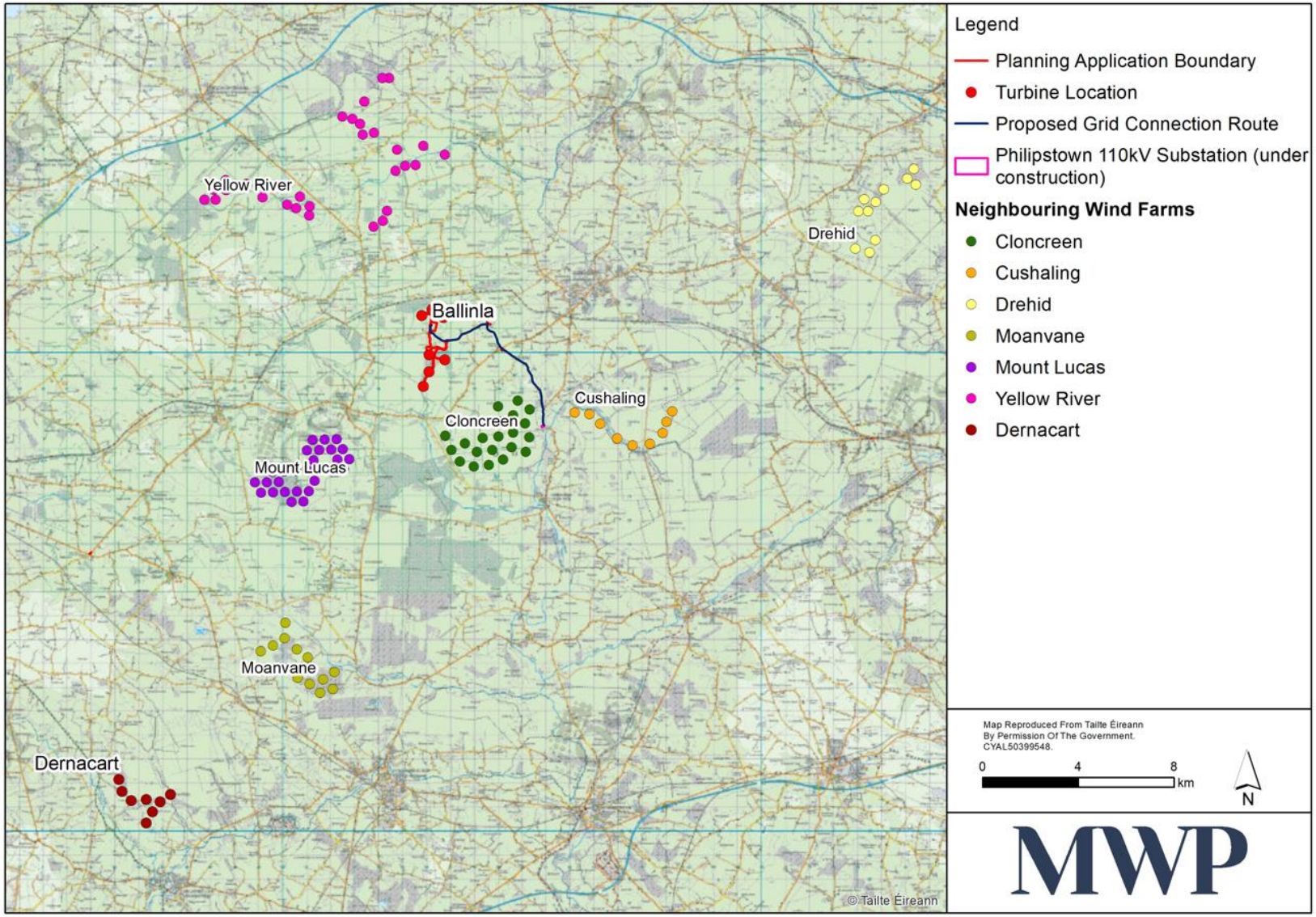

Figure 2-11: Wind Farm developments within 25km of Proposed Development

2.3.19.2 Solar Farm Developments

The nearest proposed solar farms to the Proposed Development are listed as follows:

- Kilcush Solar Farm (21/598) – c. 117.47 hectares to include PV panels mounted on metal frames, 22 No. MV power stations (Permitted by Offaly County Council but not yet constructed).
- Obton Limited Oldcourt Solar Farm (22/327) – c. 121.55 hectares of solar panels on ground mounted frames and other ancillary works (Permitted by Kildare County Council)

Kilcush Solar farm is located approximately 7km south of the Proposed Project while Oldcourt is located approximately 10km east. The potential for cumulative effects is considered in the relevant chapters of this EIAR.

2.4 Description of Construction

2.4.1 Construction Phase Land Use Requirement

Land use requirements during the construction phase will be greater than that of the permanent land take area. The temporary land take required during the construction phase is set out in Table 2-3.

Table 2-3: Land Use Requirements

Item	Description	Unit	Quantity
Construction Compound	No. 1 construction compound Site compound area 4750m2	m2	4750
Wind Turbine Construction	3310m2 per hardstand WTG construction requires temporary workspaces during the erection of the different turbine components. These workspaces include storage areas for the turbine blades and temporary areas for the assembly of the auxiliary cranes and parking	m2	23170

2.4.2 Proposed Works

The construction works for the Proposed Project 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. A comprehensive description of activities is outlined in Chapter 3 Civil Engineering. The construction of the Proposed Development will principally comprise of the following works:

- Felling of any areas of coniferous forestry plantation necessary to facilitate construction works.
- Construction of site entrances and any sections of internal access tracks necessary to facilitate access to the temporary construction compound.
- Construction of the temporary construction compound including storage area for construction materials, temporary site cabins to provide welfare facilities for site personnel, office space, meeting rooms, canteen area, mobile sanitary facilities and parking.

- Establishment of the temporary storage of stockpiled excavated topsoil and subsoil within temporary material storage areas. Establishment of the spoil deposition area at T4.
- Earthworks and drainage infrastructure associated with construction of new and upgraded internal access tracks, crane hardstand, turbine foundations and substation compound.
- Construction of upgraded and new watercourse crossings for construction of internal access tracks and underground cables.
- Excavation of turbine bases and associated turbine hardstand areas.
- Installation of sections of underground cabling between turbines.
- Installation of sections of underground cabling to selected connection point option.
- Construction of the substation compound.
- Turbine delivery works, installation, and commissioning.
- Landscaping and biodiversity enhancement.

2.4.3 Construction Methods

Details on the construction methods are fully described in **EIAR Chapter 3 Civil Engineering** and in the CEMP Volume III Appendix 2-1. **Table 2-4** provides a summary of the types of proposed construction techniques for the various elements of the Proposed Development.

Table 2-4: Proposed Construction Techniques

Element	Construction Technique
Wind turbine foundations and hardstands	Wind turbine locations will be cleared, graded, and foundations will be either excavated or piled by rotary core technique. An engineered concrete foundation will be installed in the excavated/piled structure location. Backfill will be provided, and grading will be performed in a manner to allow for immediate drainage away from each tower. Construction activities include tree removal, vegetation clearing, topsoil stripping, excavation and or piling, grading, foundation construction, final grading and landscaping of temporary works areas.
Site Access	Sightline improvements of the existing site access junction will be required. Construction activities include vegetation clearing, topsoil and/subsoil stripping, aggregate placement and grading, and landscaping of temporary works areas.
Internal access tracks	Upgrading, widening and new excavated tracks: Construction activities will include vegetation clearing, topsoil stripping, excavation, placement of geogrid/ geotextile layer and aggregate, compaction, grading, berm placement and landscaping.
	Floating Tracks: Construction activities will include removal of major protrusions, placement of geogrid/ geotextile layer and aggregate, compaction, grading, berm placement and landscaping.
Internal underground site electrical cables	To the extent possible, underground electrical collector cables will be co-located with access tracks in order to minimise the area of construction disturbance. Underground cable installation construction activities include topsoil stripping, trenching, installing electrical cables, and revegetation of disturbed areas unless the cables are under the tracks.
Substation Compound	Construction includes topsoil stripping, excavation, grading, foundation construction, building construction.
Temporary Local widening and Construction compound	Construction includes topsoil stripping, excavation, grading, aggregate placement, compaction, and landscaping.
Water crossings	Existing crossings: widening using pre-cast piping. New crossings: Clear span crossing, horizontal directional drilling and culverts.
8km Underground Cable Grid Connection (other than at water crossings)	Construction activities include excavation, trenching , backfilling, resurfacing.

2.4.4 Duration and Timing

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.

A typical programme of work is outlined in Table 2-5 below. A number of these phases will however run concurrently as outlined as follows.

- 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 onsite substation and control houses will commence so that they will be ready to export power as turbines are commissioned.

Table 2-5: 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.)

2.4.5 Major Temporary Features

Temporary features onsite 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 onsite. Any surplus material will be placed within the spoil deposition area.

2.4.6 List of Plant

Mechanical machinery and electrical equipment typically used for construction projects will be required to facilitate the Proposed Development. The following is a non-exhaustive list of plant that is typically used for wind farm and heavy civil engineering work:

- 30-50T Excavators.
- 15-30T Excavator.

- Rubber Tired 15-20T Excavator.
- 3-10T Mini Diggers.
- Mobile Crane for construction.
- Rebar/shuttering/precast units/conc. pipes/box culverts etc 60t to 120t.
- Cranes (1 main, 1 assist) Erection 120t to 1000t.
- Telescopic Handler.
- Tractors and trailers.
- Road grader.
- Double contained fuel bowsers.
- 12T Rollers.
- Diesel powered generators.
- Water bowsers.

2.4.7 Construction Working Hours

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 Proposed Development 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.

2.4.8 Construction Personnel

During the construction phase, the number of onsite construction personnel will vary for each phase of the development. 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.

2.4.9 Construction Environmental Management Plan (CEMP)

A CEMP has been prepared and will be updated throughout the pre-construction and construction phase and will be implemented on site. The CEMP will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, prior to construction, during construction and during operation of the Proposed Development, are implemented. The CEMP will collate and

manage the proposed and agreed mitigation measures, monitoring and follow-up arrangements and management of environmental impacts. The environmental commitments of the Proposed Development will be managed through the CEMP and will be secured in contract documentation and arrangements for construction and later development stages. The CEMP will mainly address the construction phase however, where monitoring is to continue into the operational phase these commitments will be communicated and transcribed into operational process documentation. The CEMP is included in Appendix 2-1 of Volume III.

2.5 Description of Commissioning

Wind farm commissioning can take approximately two to four months to complete from the erection of the final turbine to exporting of power. It involves commissioning engineers working through an entire schedule of SCADA (Supervisory Control and Data Acquisition) and electrical testing and control measures to ensure the wind farm will perform and export power to the national grid as designed.

2.6 Description of Operation

2.6.1 Land Use Requirement

The permanent land take includes the areas of wind turbine hardstands, access tracks, permanent crane hardstand areas, substation compound and forestry felling which account collectively for approximately 62% (26 ha approximately) of the total area within the wind farm planning boundary (42 ha).

2.6.2 Operating Hours and Operational Conditions

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.

Each wind turbine will be computerised to control critical functions, monitor wind conditions and report data back to a SCADA system. An anemometer mounted on the top of the wind turbine nacelle provides wind speed information used to automatically set blade pitch and control the wind turbine. A wind vane mounted on top of the nacelle provides information needed to yaw the wind turbine into the wind. The SCADA system monitors problems and diagnoses failures. If a problem causes a wind turbine to shut down, the wind turbine will either be restarted by the SCADA system operator, or service personnel will perform the necessary repairs and then manually restart the wind turbines.

In addition, the wind turbine can also be controlled manually at the nacelle, from a panel inside the base of the tower, or from a remote computer via the SCADA system. Using the tower top control panel, the wind turbine can be stopped, started, and turned out of the wind.

Turbines can be programmed to shut down during periods when shadow flicker is predicted to occur. Shadow flicker control modules will be installed on the appropriate turbines which can be programmed to shut down to eliminate the occurrence of shadow flicker at any particular dwelling, where it has been shown that shadow flicker will occur. This will ensure that the proposed wind farm will comply with existing guideline thresholds and also eliminate flicker at receptors. This is detailed in EIAR Chapter 16, Shadow Flicker.

2.6.2.1 Turbine Maintenance

During the operation of the wind farm, the turbine manufacturer, the Applicant or a service company will carry out regular maintenance of the turbines. During the lifetime of the Proposed Development, it is envisaged that at least two permanent jobs will be created locally in the form of an operator or maintenance personnel. In addition, operation and monitoring activities may be carried out remotely with the aid of computers connected via a broadband link.

2.6.2.2 Grid Maintenance

It is unlikely that the underground cable will require much maintenance during its operation, however in the event a fault does occur, inspection of the fault will be carried out to determine what works to the ducting may be required.

2.7 Decommissioning and Restoration Phase of the Proposed Development

2.7.1 Wind Farm

At the end of the estimated 35-year lifespan of the wind farm element of the Proposed Development, it will be decommissioned and reinstated with all seven wind turbines and towers removed. Removal of infrastructure will be undertaken in line with landowner and regulatory requirements and best practice applicable at the time. The information below outlines the likely decommissioning tasks based on current requirements and best practice.

Prior to the decommissioning work, the following will be provided to Offaly County Council for approval:

- A plan outlining measures to ensure the safety of the public workforce and the use of best available techniques at the time.
- A comprehensive reinstatement proposal, including the implementation of a program that details the removal of all structures and landscaping, as required.

During decommissioning, cranes of similar size to those used for construction will disassemble each turbine. The towers, blades and all components will then be removed.

Wastes generated during the decommissioning phase will be taken off site and disposed of at an authorised waste facility. Any materials suitable for recycling will be disposed of in an appropriate manner.

At present it is anticipated that underground cables connecting the turbines to the substation will be cut back and left underground. The cables will not be removed if an environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them *in situ*. The assessment will be carried out closer to the time to take into account environmental changes over the Proposed Development life.

Hardstand and turbine foundation areas will be left in situ and covered with soil to match the existing landscape. Access tracks will be left for use by the landowners.

2.7.2 Substation and Grid Connection

The onsite substation and Proposed Grid Connection will remain a permanent part of the national grid and therefore decommissioning is not foreseen. In the event of decommissioning, it will involve removing above ground structures and equipment while leaving underground infrastructure in place.

2.8 The Use of Natural Resources

2.8.1 Aggregate

Large amounts of aggregates, concrete, and steel will be used during construction. 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 2-6: Summary of Approximate Aggregate and Steel Quantities

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 stoner 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 IPP	tonnes	41
Reinforced steel for lidar unit	tonnes	0
Total volume of imported steel reinforcement required	**tonnes**	**1323**

Local quarry facilities in the area which are capable of supplying these construction materials, have been identified and are included in the TMP. The TMP is available in **Appendix 15**, **Volume III**.

Table 2-7: Potential Sources of Local Aggregate/Concrete

Facility	Location	Material	Distance
Kilmurray Sand and Gravel	Derryarkin, Co. Offaly.	Rock	13km
Roadstone Alenwood	Allen, Killeagh, Naas, Co. Kildare	Rock/Concrete	29km
Kilsaran Claonard	Kilrathmurry, Clonard, Co. Meath, A83 DW28	Rock/Concrete	20km

2.8.2 Water

Water needs for construction activities will be limited to concrete truck chute washing, wheel wash, dust suppression and sanitary facilities. This water requirement will be sourced from onsite rainwater collection systems and settlement ponds.

It is estimated that up to approximately 3,000 litres per day (l/d) of potable water will be required during peak construction for employees. It is proposed that this potable water requirement will be imported in bulk water tanks.

Potable water for the operational and maintenance phase is estimated to be approximately 50 l/d. This water will be supplied as bottled water.

2.9 The Production of Waste

2.9.1 Domestic Waste-Water Effluent

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 licensed/permitted waste facility for treatment and disposal. Table 2-8 outlines some known waste facilities which are approved to accept this waste stream and may be utilised.

During the peak construction time period, wastewater production is estimated to be 3,000l/d.

Although primarily controlled remotely, 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 two workers, resulting in a typical wastewater production rate of 100l/d. 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 is due for empty. The holding tank will be emptied by a permitted contractor only.

2.9.2 General Wastes

Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, shuttering timber & 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 offsite 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.

The power generation aspect of the Proposed Development would not produce any waste emissions or pollutants. The general operation and maintenance of the Proposed Development has the potential 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 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.

Table 2-88: Sample of Authorised Waste Facilities

	EWC code	Facility	Location
Soils	17 03 02	Kilmurray Pre-Cast Concrete Ltd	Derryarkin, Rhode, Co. Offaly
Domestic Wastewater (Septic Tank Sludge)	20 03 04	Derryville Environmental Solutions	Derryville, Moyne, Thurles, Co. Tipperary
C & D Waste	17 01 07	Kilmurray Pre-Cast Concrete Ltd	Derryarkin, Rhode, Co. Offaly
Waste Oils	13 02 08	Enva Ireland Ltd	Clonminan Industrial Est, Portlaoise, Co. Laois
Domestic Waste	20 03 01	Guessford Limited	Barnan, Daingean, Co. Offaly
Oil Interceptors	13 05 01 13 05 02 13 05 03 13 05 06 13 05 08	Enva Ireland Ltd	Clonminan Industrial Est, Portlaoise, Co. Laois

2.10 Emissions and Disturbances

The anticipated residues and emissions likely to be generated during the Proposed Development lifetime are summarised in Table 2-9 below. These environmental effects have been identified, assessed and proposals for management of the anticipated disturbances and/or emissions are presented throughout relevant chapters of this EIAR.

Table 2-99: Emissions and Nuisances

	Aspect	Potential Emission/Disturbance	Assessment Provided
Construction /Decommissioning	Air	The main emissions to atmosphere during the construction stage of the Proposed Development is from fugitive dust associated with the following activities: • Groundworks associated with the construction of the Proposed Development infrastructure. • Transportation and unloading of crushed stone around the site. • Vehicular movement over potentially hard dusty surfaces such as freshly excavated and constructed access tracks and crane hardstanding areas. • Vehicular movement over material potentially carried off site and deposited on public roads. The movement of machinery, construction vehicles and the use of generators during the construction phase will also generate exhaust fumes containing predominantly carbon dioxide (CO_2), sulphur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), and particulate matter (PM10).	EIAR Vol 2 Chapter 13 Air and Climate
	Noise	Traffic flows, excavation/blasting, mechanical machinery and electrical equipment typically used for construction Proposed Developments would generate noise emissions.	EIAR Vol 2 Chapter 10 Noise

	Aspect	Potential Emission/Disturbance	Assessment Provided
	Water	Surface water runoff and discharges from construction working areas are likely during construction, although the quantity of surface runoff would not change overall as a result of the construction work. Occasional and low quantity discharges could arise from pumping in order to dewater foundation excavations. This would be discharged to the water management drainage system. Pollution sources could arise as a result of soil erosion or from oil/ fuel or chemical storage and use. Proposals for management of water quality and quantity from the Proposed Development are presented in EIAR Volume 3: Appendix 2-1: CEMP.	EIAR Vol 2 Chapter 8 Water
	Traffic	The additional traffic, especially heavy goods vehicles associated with the construction phase, has the potential to cause disturbance to those using the local road networks.	EIAR Vol 2 Chapter 5 Population and Human Health, EIAR Vol 3 Appendix 15
Operational	Air	Due to the nature of the Proposed Development no significant point source or diffuse air emissions will be produced during its operation.	EIAR Vol 2 Chapter 13 Air and Climate
	Noise	Potential noise disturbance from operational turbines and a proposed new 110kV onsite substation. Any perceived noise disturbance will be in compliance with limits.	EIAR Vol 2 Chapter 10 Noise
	Water	No water emissions or pollution sources have been identified for the operational phase.	EIAR Vol 2 Chapter 8 Water
	Shadow Flicker	In certain conditions, the movement of wind turbine blades could give rise to shadow flicker disturbance at nearby residential receptors. Any perceived shadow flicker disturbance at receptors will be eliminated through the installation of control modules.	EIAR Vol 2 Chapter 16 Shadow Flicker

2.11 Environmental Protection Measures

The design of the Proposed Development was primarily influenced by *mitigation by avoidance*. Buffers and set back distances are the principal tool used by the MWP designers when incorporating mitigation by design and avoidance. This methodology has been applied successfully nationally and internationally by the design team. This can only be done when all the environmental sensitivities have been established across the Proposed Development area. Buffers and set back distances have been derived from guidance documents, stakeholder input, studies and Proposed Development experience. The buffers and set back distances applied in this instance are outlined in Chapter 4 Alternatives.

The key to avoiding environmental impacts during the works is down to design mitigation, good site management practices, tight controls, regular inspections and ongoing vigilance with staff and employees on site. The CEMP (refer to Appendix 2-1 of the EIAR) details the environmental protection measures that will be implemented during the construction phase, with measures required during the operational phase also incorporated.

2.11.1 Surface Water Management System

A site drainage system will be constructed on the site so as to attenuate run-off, guard against soil erosion and safeguard downstream water quality. The measures are outlined in Chapter 3 Civil Engineering and in the planning application Drawing No. 23882-MWP-00-00-DR-C-5019 to 23882-MWP-00-00-DR-C-5031.

2.11.2 Site Management Controls

Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillages occur. There will be no domestic wastewater discharges to the environment. Temporary toilet facilities will include an integrated wastewater holding tank and will be emptied routinely by a licenced waste contractor. A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc.

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

2.12 Transboundary Effects

The location of the Proposed Development is entirely in County Offaly within the Republic of Ireland. Transboundary impacts relate to potential impacts on other Member States, i.e. outside of the Republic of Ireland.

Considering the nature of the Proposed Development, the largely localised nature of potential impacts and the distance from neighbouring member states, it is considered that any potential for impacts on transboundary receptors would not arise. Following on from the assessments carried out as part of the EIAR studies, it is concluded that the Proposed Development is unlikely to result in significant transboundary impacts.

2.13 Risk of Major Accidents and Disasters

It is considered that there is no risk for the Proposed Development to cause major accidents and/or disasters or vulnerability of the Proposed Development to potential disasters/accidents, including the risk to the Proposed Development of both natural disasters and man-made disasters for the following reasons:

2.13.1 Construction Risks

As in all construction activities, there is a wide range of potential risks of accidents and hazards associated with wind farm construction. While many risks are similar in nature to those for other industries, wind farm construction works take place in exposed windy locations and involve transport of heavy equipment, heavy cranage and specialised electrical installation works.

2.13.1.1 Health and Safety

All work on site will be carried out in compliance with all relevant Legislation and Work Practices including the below, to ensure that the construction areas, site environs and public roads remain safe for all users. This legislation includes:

- Safety, Health & Welfare at Work (Construction) Regulations 2013.
- Safety, Health & Welfare at Work Act 2005.
- Safety, Health & Welfare at Work (General Applications) Regulations 2007 to 2020.
- Irish Wind Energy Association Best Practice Guidelines.

The CEMP (refer to Appendix 2-1 of the EIAR) outlines the safety procedures that will be implemented during the construction phase. The effective implementation of the CEMP will help to reduce the risks associated with the construction phase of the Proposed Development.

2.13.1.2 Peat Stability

A scoping exercise was carried out to determine whether a detailed Peat Landslide Hazard and Risk Assessment was required for this site. This scoping exercise reviewed whether peat was present onsite. Peat was mapped on the GSI maps for the southern section of the site at the locations of four wind turbines. During a site walkover peaty type soil was noted in the southern section of the site. The extents of the area were mapped, and peat probes were carried out. A peat stability risk assessment was carried out for the Proposed Development (see Appendix 9).

Overall, there is no risk of instability of the site, access tracks, turbine bases, or grid connection from peat.

2.13.2 Operational Issues

2.13.2.1 Fire/ Fuels

The presence of electrical generating equipment and electrical cables along with the storage and use of various oils (diesel fuels, lubricating oils, hydraulic fluids) can create the potential for fire and/or ground contamination. This potential exists within the turbine tower, nacelle, substation, electrical transmission structures and operations maintenance buildings. Modern wind farm design will minimise the use of combustible materials. Lightning and surge protection will cover the nacelle and rotor blades, as well as electrical equipment, including cables. Each element of equipment has strict and exact operational protocols that provide for the elimination of risk. The protocols set out the flammability or chemical properties of each of the oils, lubricants and fuels that may be used within equipment on site. The Proposed Development will be operated to the specifications of the chosen turbines and in accordance with all electrical standard operating procedures.

2.13.2.2 Lightning Strikes

A lightning strike could cause a fire or could cause severe damage to blades which may lead to blade failure. To protect wind turbines from damage caused by a lightning strike and to provide grounding, each turbine will be equipped with an electrical grounding system.

2.13.2.3 Turbine Structural Failure

Turbine structural failure includes tower collapse, blade failure or separation. Risk may arise due to stress, wear and tear.

Rigorous safety checks are conducted on the turbines during operation to ensure the risks posed to staff, landowners and general public are negligible. These checks are specified particular to the turbine model for the Proposed Wind Farm. The separation distances of turbines from public roads and residences are well beyond fall over distances that would present a risk of significant accidents.

2.14 Impact of Climate Change

2.14.1 Severe Weather

There is potential for the Proposed Development to be impacted by severe weather including increased wind and storms due to climate change. However, wind turbines are designed to withstand extreme weather conditions with brake mechanisms installed within the turbines so that they only operate under specific wind speeds and will shut down during high wind speed events. Therefore, there is very low risk to the Proposed Development from high wind speeds.

2.14.2 Flooding

Flood risk is considered in the Flood Risk Assessment (FRA) (Appendix 8) to determine whether the Proposed Development is at potentially vulnerable from extreme fluvial flooding events. The FRA concludes that the substation and T1 are in flood zone B and the Proposed Development may be vulnerable to flooding. As such the design of the Proposed Development has taken this into account and all recommended freeboards given as mitigations in the FRA are achieved. Once the freeboards recommended are achieved the Proposed Development will not be at risk of flooding. Once all mitigations in the FRA are implemented it also concludes that the development will not have an adverse impact on flooding outside of the Proposed Development boundary.

2.15 References

Offaly County Development Plan 2021-2027.

Offaly Wind Energy Strategy (2021-2027).

Department of Agriculture, Food and the Marine – Standards for Felling and Reforestation (2019).

Department of the Environment, Heritage, and Local Government (DoEHLG) – Wind Energy Development Guidelines (2006).

Draft Revised Wind Energy Development Guidelines. Department of Housing Planning and Local Government, 2019.

Forest Service, Department of the Marine and Natural Resources – The Forestry and Water Quality Guidelines (2000).

Forest Service, Department of the Marine and Natural Resources – The Forestry Harvesting and the Environmental Guidelines (2000).

Irish Wind Energy Association Best Practice Guidelines (2012).

Safety, Health & Welfare at Work (Construction) Regulations 2013.

Safety, Health & Welfare at Work Act 2005.

Safety, Health & Welfare at Work (General Applications) Regulations 2007 to 2020.