

1. INTRODUCTION

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by McCarthy Keville O’Sullivan Ltd. (MKO) on behalf of Bord na Móna Powergen Ltd., as part of an application for planning permission for the construction of a wind energy development in Derrinlough and adjacent townlands, Co. Offaly, as listed in Table 1.1 Townlands within which the proposed development is located below.

The proposed wind energy development will encompass 21 No. wind turbines up to a tip height of 185 metres above the top of the foundation and will have a maximum export capacity (MEC) in excess of 85MW. The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Acts 2000 to 2019 and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Acts 2000 to 2019.

Table 1.1 Townlands within which the proposed development is located

Townland	
Ballindown	Derryad (Eglis by)
Balliver	Derrymullin and Loughderry
Broughal	Drinagh
Carrick (Garrycastle by)	Galros East
Clongawny More	Galros West
Cloonacullina	Guernal
Clooneen	Kilcamin
Coolreagh or Cloghanhill	Lumcloon
Cortullagh or Grove	Mullaghakaraun Bog
Crancreagh	Stonestown
Dernafanny	Timolin
Derrinlough	

The proposed development, known as Derrinlough Wind Farm, will be located on Clongawny and Drinagh Bogs which are part of the Boora peat production bog group in Co. Offaly. Although peat extraction has currently ceased at the site, it continues to comply with the requirements of the IPC licence for Boora bog group (IPC Licence Register No. P0500-01) which is regulated by the Environmental Protection Agency (EPA).

The two bogs have a total area of approximately 2,360 hectares. Combined they are approximately 6 kilometres (km) long in a north/south direction and 9km wide in an east/west direction at their widest

point. The closest settlements to the site are Cloghan which is located approximately 2km to the north and Fivealley which is located approximately 2.5km to the south. Other settlements and towns in the area include Banagher (c. 3km west), Ferbane (c. 6km north) Birr (c. 7km south-west) and Shannonbridge (c. 15km north-west). The site location is shown on Figure 1.1.

The Derrinlough Briquette Factory is located between the two bogs, along the N62 on the eastern side of the road. This plant processes the peat from a number of bogs in the midlands into briquettes and consists of the factory and a number of ancillary buildings. The briquette factory is in operation since 1960. The surrounding bogs were developed and drained during the 1950's in order to be available to the Briquette factory when it commenced processing in 1960.

The land uses and types within the proposed development site are a mixture of bare cutover and cutaway peat, re-vegetation of bare peat, commercial forestry, telecommunications (a 30m Mast) and wind measurement (a single 100m anemometry mast on Clongawny Bog). There are also a number of Bord na Móna rail lines that pass through the bogs facilitating the transportation of milled peat to the Briquette Factory.

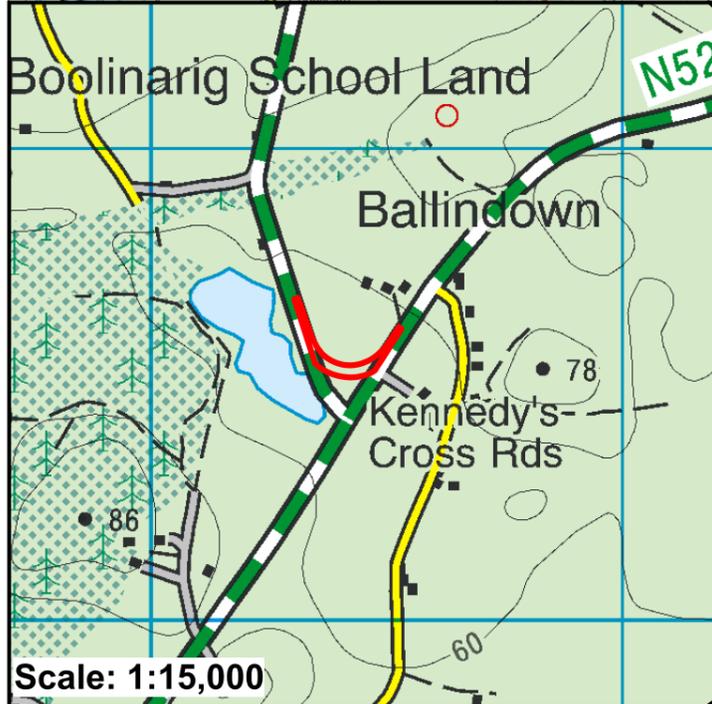
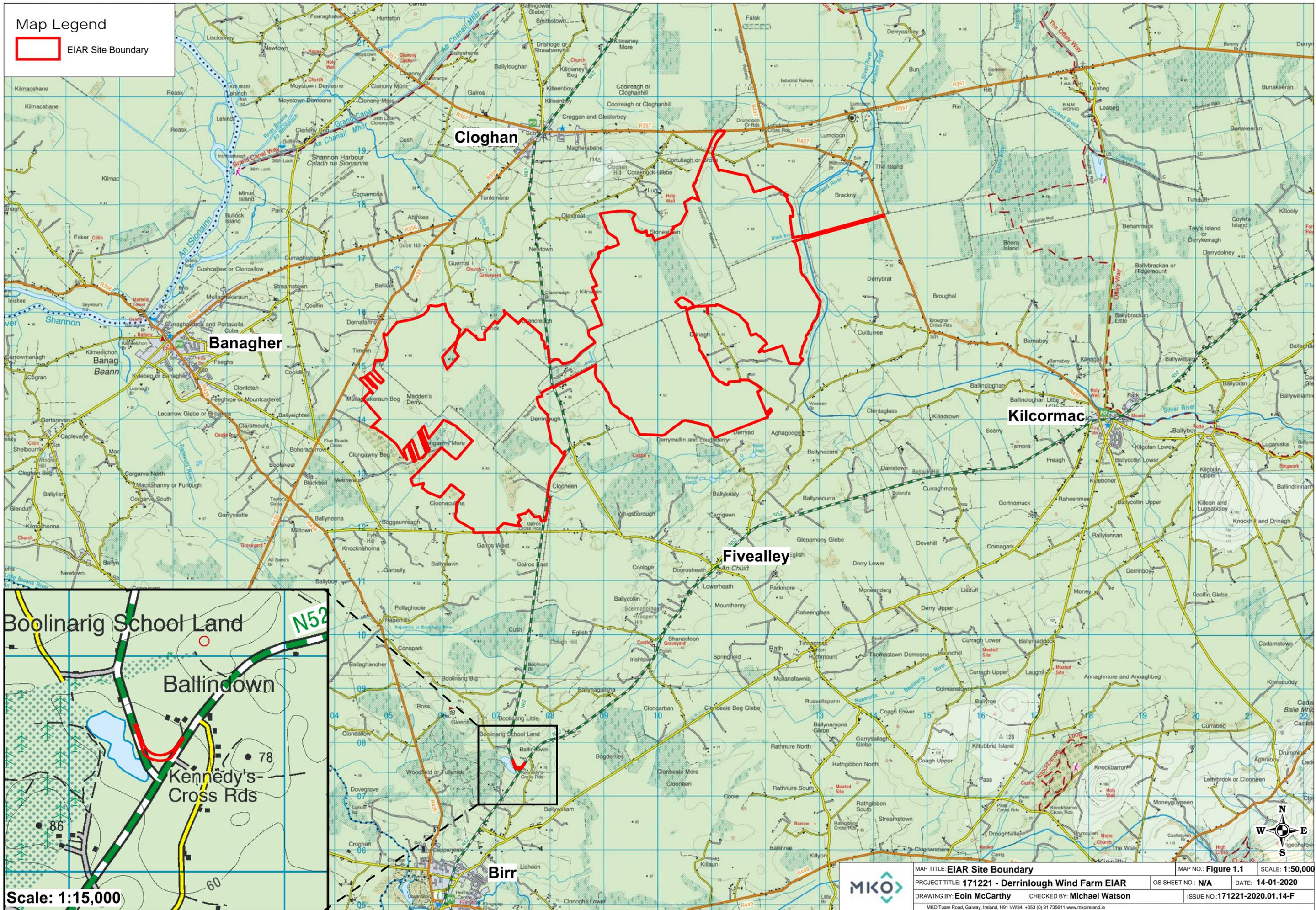
The surrounding land uses and types comprise a mixture of forestry, agricultural land, a mosaic of active peat extraction, cutover and cutaway peatland, amenity (e.g. Lough Boora Parklands) and wind energy. The operational Meenwaun Wind Farm is located adjacent to the southwestern boundary of the proposed development site.

The ESB owned, peat powered, West Offaly Power Station which is scheduled to close in 2020, is a significant piece of energy infrastructure in the area and is located immediately south of Shannonbridge with the peat supplied from the surrounding Bord na Móna bogs.

Grid infrastructure in the area includes a 400 kV line from Moneypoint to Woodland Station near Dublin which runs approximately 3km to the south of the site. There are two 220 kV lines, one running south from Shannonbridge approximately 1km to the west of Clongawny bog and another running eastwards from Shannonbridge approximately 7 km to the north of both bogs. There is also a 110 kV network in the area with two lines running to the north of Clongawny and Drinagh, one line to the west of Clongawny and one line to the east of Drinagh.

Map Legend

 EIAR Site Boundary



	MAP TITLE: EIAR Site Boundary	MAP NO.: Figure 1.1	SCALE: 1:50,000
	PROJECT TITLE: 171221 - Derrinough Wind Farm EIAR	OS SHEET NO.: N/A	DATE: 14-01-2020
	DRAWING BY: Eoin McCarthy	CHECKED BY: Michael Watson	ISSUE NO.: 171221-2020.01.14-F
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Legislative Context

On the 25th November 2019, An Bord Pleanála decided that the proposed development falls within the scope of Strategic Infrastructure Development under Section 37A of the Planning and Development Acts 2000 to 2019.

The consolidated European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the ‘EIA Directive’), has been transposed into Irish planning legislation by the Planning and Development Acts 2000 to 2019 and the Planning and Development Regulations 2001 to 2019. The EIA Directive was amended by Directive 2014/52/EU which has been transposed into Irish law with the recent European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). Most of the provisions of the new regulations came into operation on the 1st of September 2018 with a number of other provisions coming into operation on the 1st of January 2019.

Accordingly, this EIAR complies with the EIA Directive as amended by Directive 2014/52/EU. To the extent relevant and necessary, regard has been had to the existing provisions of the Planning and Development Act 2000 to 2019 and the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The Environmental Impact Assessment (EIA) of the proposed project will be undertaken by An Bord Pleanála, as the competent authority.

Article 5 of the EIA Directive as amended by Directive 2014/52/EU provides where an EIA is required, the developer shall prepare and submit an environmental impact assessment report (EIAR). The information to be provided by the developer shall include at least:

- a) *a description of the project comprising information on the site, design, size and other relevant features of the project;*
- b) *a description of the likely significant effects of the project on the environment;*
- c) *a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- d) *a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;*
- e) *a non-technical summary of the information referred to in points (a) to (d); and (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*

In addition, Schedule 6 to the Planning and Development Act 2000 to 2019 sets out the information to be contained in an EIAR, with which this EIAR complies.

MKO was appointed as environmental consultant on the proposed project and commissioned to prepare this EIAR in accordance with the requirements of the EIA Directive as amended by Directive 2014/52/EU.

The relevant classes/scales of development that normally require Environmental Impact Assessment (EIA) are set out in Schedule 5 of the Planning and Development Regulations 2001 to 2019. The relevant class of development in this case relates to “installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts”, as per Item 3(i) of the Schedule. The proposed development exceeds 5 turbines and 5 Megawatts in scale, and therefore is subject to EIA.

The EIAR provides information on the receiving environment and assesses the likely significant effects of the proposed project on it and proposes mitigation measures to avoid or reduce these effects. The function of the EIAR is to provide information to allow the competent authority to conduct the Environmental Impact Assessment (EIA) of the proposed project.

All elements of the project, (including the wind turbines and associated infrastructure, substation, grid connection and turbine delivery route) have been assessed as part of this EIAR.

1.2.1 EIAR Guidance

The Environmental Protection Agency (EPA) published its *'Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, August 2017), which is intended to guide practitioners preparing an EIAR in line with the requirements set out in the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

In preparing this EIAR regard has also been taken of the provisions of the *'Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment'*, published by the Department of Housing, Planning and Local Government (DHPLG) in August 2018 to the extent these guidelines are relevant having regard to the enactment of the revised EIA Directive.

The European Commission also published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including *'Guidance on Screening'*, *'Guidance on Scoping'* and *'Guidance on the preparation of the Environmental Impact Assessment Report'*. MKO has prepared the EIAR with regard to these guidelines also.

1.2.2 Wind Energy Development Guidelines for Planning Authorities

The relevant considerations under the *'Wind Energy Development Guidelines for Planning Authorities'* (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) have also been taken into account during the preparation of this EIAR.

The *'Wind Energy Development Guidelines for Planning Authorities'* (DoEHLG, 2006) are currently the subject of a targeted review. The proposed changes to the assessment of impacts associated with onshore wind energy developments are outlined in the document *'Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review'* (December 2013), the *'Review of the Wind Energy Development Guidelines 2006 – Preferred Draft Approach'* (June 2017), and the Draft Revised Wind Energy Development Guidelines (December 2019). A consultation process in relation to the 2019 document commenced on the 12th of December 2019 and is currently being undertaken by the Department of Housing, Planning and Local Government (DoHPLG).

Should the revised Wind Energy Guidelines be adopted in advance of a planning decision being made on the proposed development, with current noise and shadow flicker thresholds being amended, if necessary, the proposed development is capable of complying with any revised noise and shadow flicker requirements by implementing mitigation through use of the turbine control systems. Further detail on this is provided in the relevant chapters.

1.3

The Applicant and Project Background

The Proposed Project is being brought forward by Bord na Móna Powergen Ltd., the ‘Applicant’. Bord na Mona Powergen Ltd. is a subsidiary of Bord na Móna plc.

Bord na Móna plc is a publicly owned company, originally established in 1946 to develop and manage some of Ireland’s extensive peat resources on an industrial scale, in accordance with government policy at the time. Bord na Móna’s lands extend to approximately 80,000 hectares in total and are located mainly in the Irish midlands. Bord na Móna Powergen currently manages and operates a portfolio of thermal and renewable assets, namely Edenderry Power Plant a peat/biomass generating unit, Cushaling peaking plant, Bellacorick, Mountlucas, Bruckana and Oweninny wind farms, and the Drehid landfill gas facility.

In 2015, Bord na Móna published its ‘Sustainability Statement 2030’, which sets out the company’s commitment to transition to peat-free electricity generation by 2030. Renewable energy generation, including solar power, biomass and wind power, is a key component of this transition. In October 2018, Bord na Móna announced its strategy to decarbonise, accelerating moves away from its traditional peat business into renewables, resource recovery and new sustainable businesses. Bord na Móna’s target is for 75% of energy being generated by the company being renewable by 2020. Their aim to accelerate the development of renewable energy is a move to support national climate and energy policy targets.

Bord na Móna has a long track record of developing energy projects, dating back to the development of the first generation of peat-fired power stations. Renewable energy is a strategic growth area for the company and is aligned with its corporate strategy, which includes reducing carbon emissions.

1.4

Brief Description of the Proposed Development

The proposed development comprises the construction of 21 No. wind turbines and all associated works. The proposed turbines will have a blade tip height of up to 185 metres above the top of the foundation. The applicant is seeking a ten-year planning permission. The full description of the proposed development, as per the public planning notices, is as follows:

- i. 21 No. wind turbines with an overall blade tip height of up to 185 metres and all associated hard-standing areas.*
- ii. 2 No. permanent Anemometry Masts up to a height of 120 metres.*
- iii. Provision of new and upgraded internal site access roads, passing bays, amenity pathways, amenity carpark and associated drainage.*
- iv. 2 No. permanent underpasses in the townland of Derrinlough. One underpass will be located beneath the N62 and one will be located beneath an existing Bord na Móna rail line.*
- v. 1 No. 110 kV electrical substation, which will be constructed in the townland of Cortullagh or Grove. The electrical substation will have 2 No. control buildings, associated electrical plant and equipment and a wastewater holding tank.*
- vi. 5 No. temporary construction compounds, in the townlands of Clongawny More, Derrinlough, Derrinlough/Crancreagh, Drinagh and Cortullagh or Grove.*
- vii. All associated underground electrical and communications cabling connecting the turbines to the proposed electrical substation.*
- viii. 2 No. temporary security cabins at the main construction site entrances in the townland of Derrinlough.*
- ix. All works associated with the connection of the proposed wind farm to the national electricity grid, which will be to the existing Dallow/Portlaoise/Shannonbridge 110 kV line.*
- x. Removal of existing meteorological mast.*

- xi. Upgrade of existing access and temporary improvements and modifications to existing public road infrastructure to facilitate delivery of abnormal loads including locations on the N52 and N62; construction access for delivery of construction materials at locations on the N62 and R357; operational access onto L7009 in the townland of Cortullagh or Grove and amenity access off R357 and L7005.*
- xii. All associated site works and ancillary development including signage.*
- xiii. A 10-year planning permission and 30-year operational life from the date of commissioning of the entire wind farm.*

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the proposed development, will have an operational lifespan greater than the 30-year operational life that is being sought as part of this application.

Modern wind turbine generators typically have an output of between 3.0 and 6MW. For the purposes of this EIAR a wind turbine model with a rated output of 4.2MW has been chosen as this is considered to be representative of the typical turbine capacity currently available. Therefore, based on 21 no. wind turbines, the proposed wind turbines will have a combined output of 88.2MW.

The layout of the proposed development has been constraints-led, thereby avoiding the environmentally sensitive parts of the site.

The site boundary for the purposes of this EIAR, corresponds to the red-line boundary included in the planning application for the proposed development and encompasses an area of approximately 2,360 hectares. Where the 'site' is referred to in this EIAR, this means the primary study area for the EIAR. In some cases, the study area extends beyond the red-line boundary depending on the requirements of individual assessments. Where this occurs, the extent of the study area will be outlined in the relevant chapter, as required. The proposed permanent footprint of the proposed development measures approximately 34.2 hectares, which represents approximately 1.45% of the primary study area.

The EIAR Site Boundary is illustrated on Figures 1.2a and 1.2b. Aerial views of the EIAR Site Boundary are shown in Figures 1.3a and 1.3b.

The proposed grid connection forms part of the planning application and its potential significant effects are assessed within the EIAR. It is proposed to construct a 110kV substation within the site and to connect from here to the existing Dallow/Portlaoise/Shannonbridge 110 kV overhead line, located in the northwest of the site. Connection will be via either overhead line or underground cabling. The connection route measures approximately 280 metres in total.

The proposed development will require the construction of a short bypass, located just north of the existing junction between the N52 and N62 National Secondary Routes, for the purposes of abnormal load delivery. The bypass will measure approximately 160 metres and will only be in use during the turbine delivery stage of the proposed development after which the existing boundaries will be reinstated. During the operational phase of the proposed development, the bypass will only be used should an abnormal load need to be delivered to the site, and the boundaries reinstated

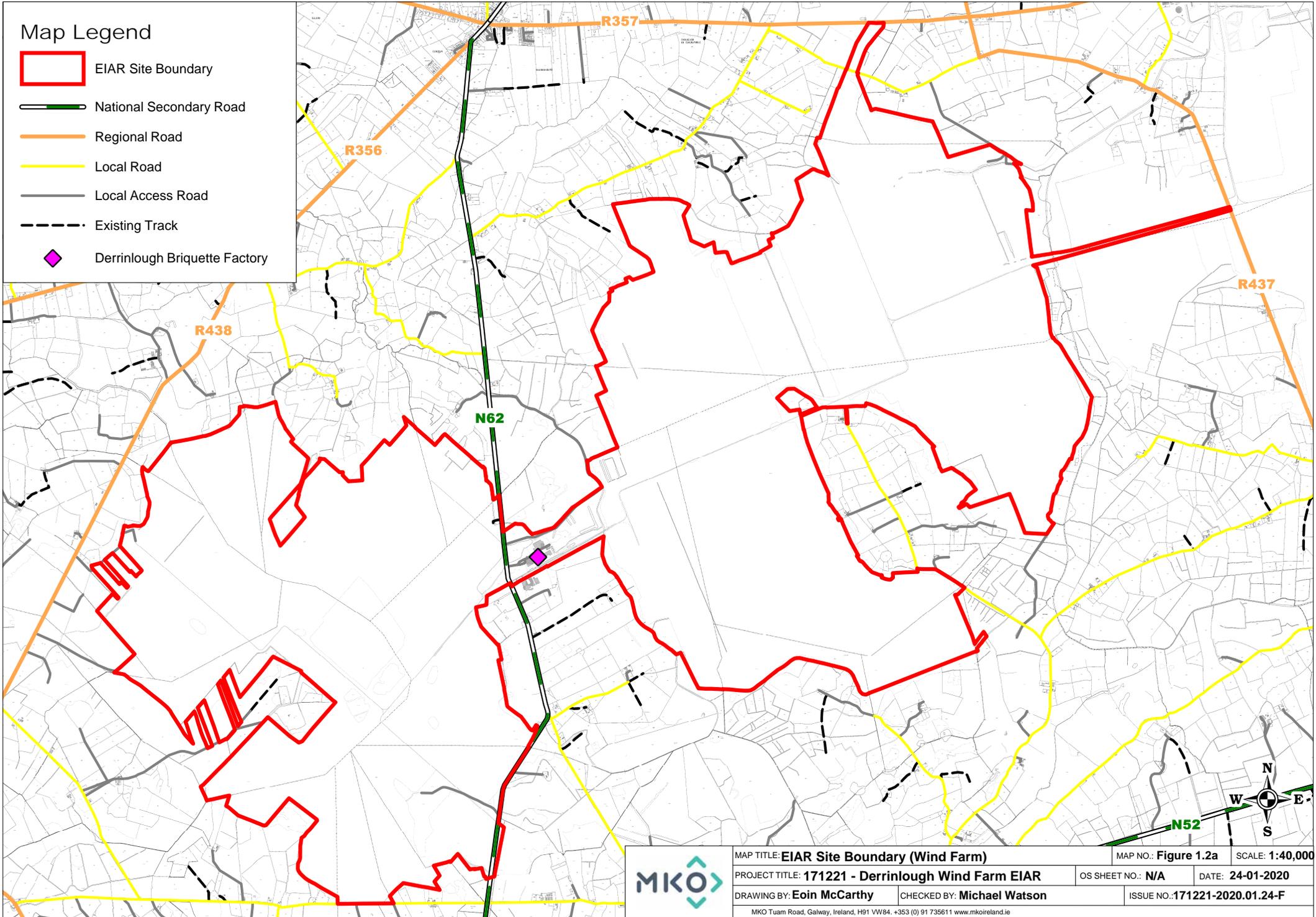
The potential significant effects of all elements of the proposed project, including grid connection and the proposed N62/N52 junction bypass, have been assessed as part of this EIAR.

A significant minimum separation distance from houses of 750 metres has been achieved with the project design.

The proposed development is described in detail in Chapter 4 of this EIAR.

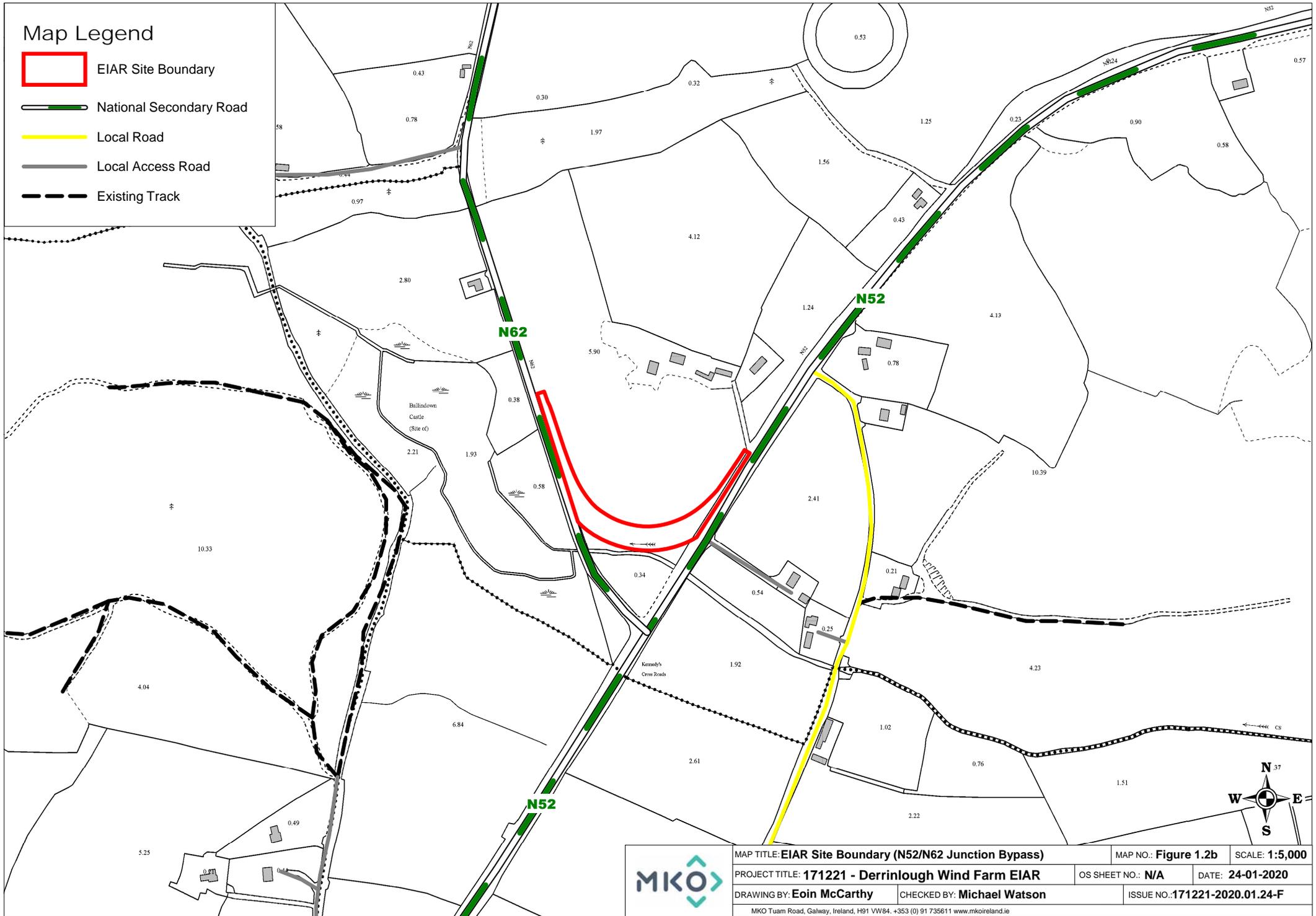
Map Legend

-  EIAR Site Boundary
-  National Secondary Road
-  Regional Road
-  Local Road
-  Local Access Road
-  Existing Track
-  Derrinlough Briquette Factory



Map Legend

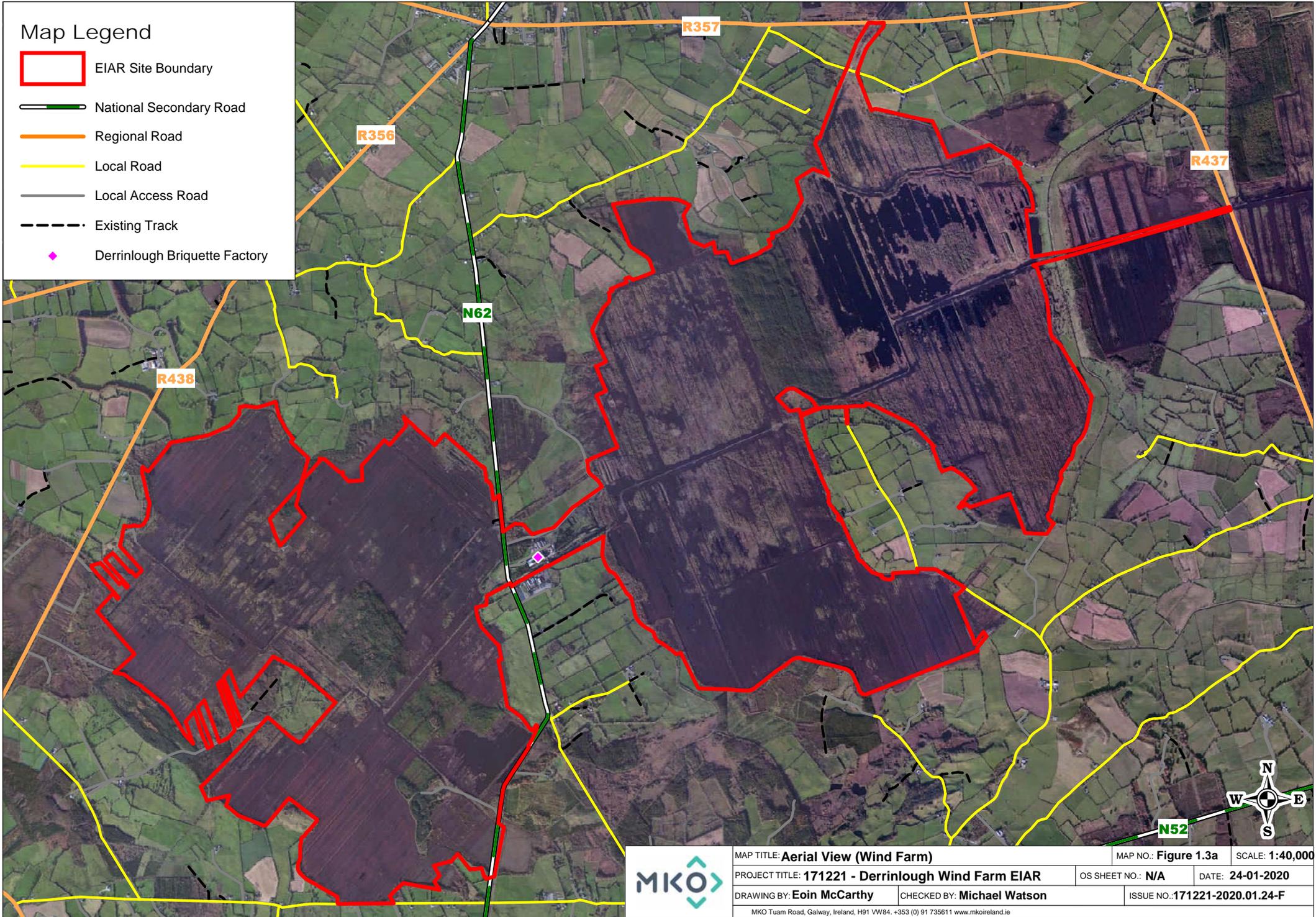
- EIAR Site Boundary
- National Secondary Road
- Local Road
- Local Access Road
- Existing Track



	MAP TITLE: EIAR Site Boundary (N52/N62 Junction Bypass)		MAP NO.: Figure 1.2b	SCALE: 1:5,000
	PROJECT TITLE: 171221 - Derrinlough Wind Farm EIAR		OS SHEET NO.: N/A	DATE: 24-01-2020
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Map Legend

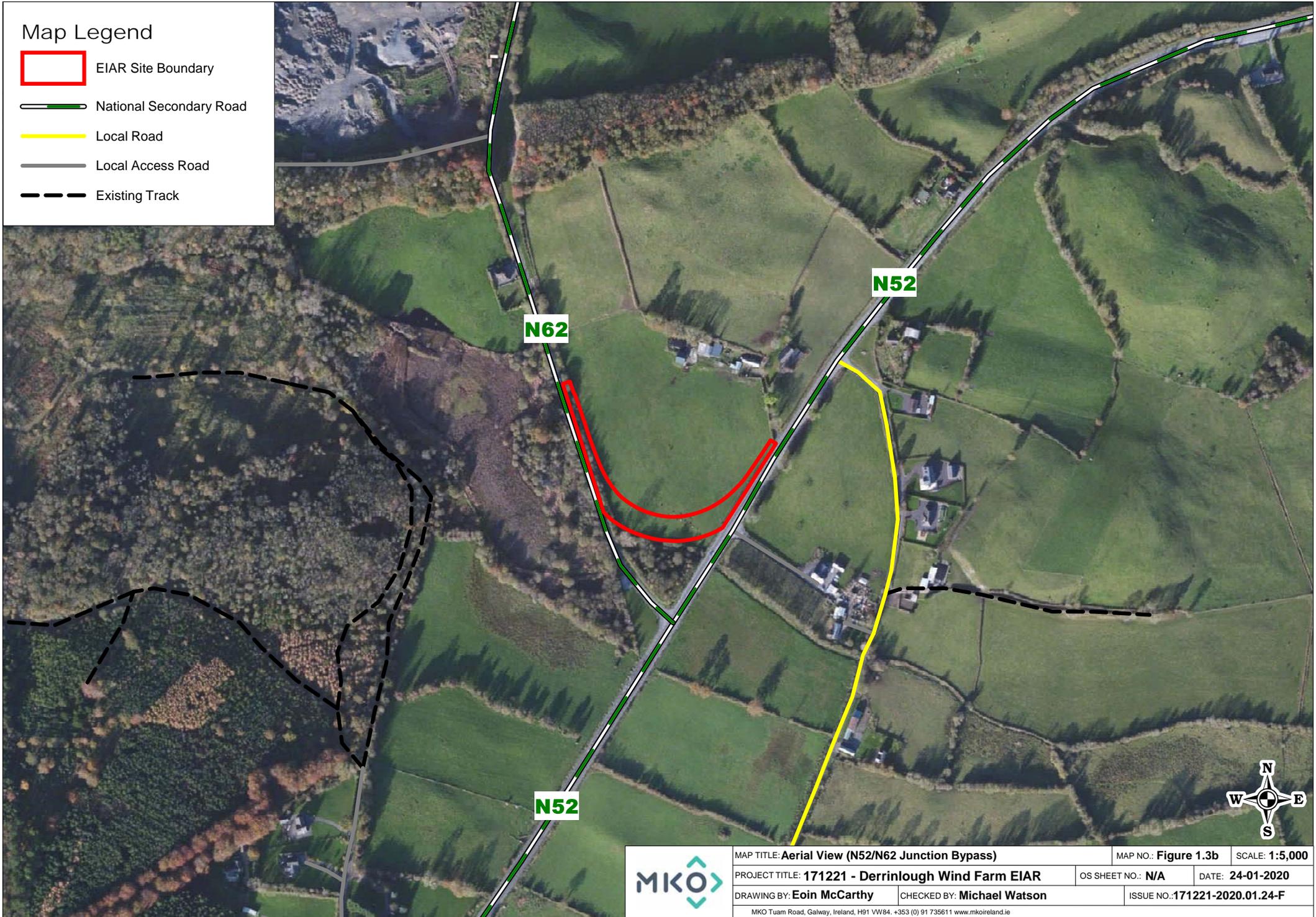
- EIAR Site Boundary
- National Secondary Road
- Regional Road
- Local Road
- Local Access Road
- Existing Track
- ◆ Derrinlough Briquette Factory



	MAP TITLE: Aerial View (Wind Farm)		MAP NO.: Figure 1.3a	SCALE: 1:40,000
	PROJECT TITLE: 171221 - Derrinlough Wind Farm EIAR		OS SHEET NO.: N/A	DATE: 24-01-2020
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Map Legend

-  EIAR Site Boundary
-  National Secondary Road
-  Local Road
-  Local Access Road
-  Existing Track



1.5 Need for the Proposed Development

1.5.1 Overview

It is now clear that Ireland will not meet its 2020 target for renewable energy with the Sustainable Energy Authority of Ireland (SEAI) reporting in May 2019 that 13 per cent of Ireland's energy will come from renewable sources by 2020, three per cent short of our European target of 16 per cent (SEAI, May 2019). Ireland faces significant challenges through efforts to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. Further detail can be found in Section 2.3.3 of this EIAR.

In March 2019, the Government announced a renewable electricity target of 70% by 2030. The proposed development is likely to be operational before 2030 and would therefore contribute to this 2030 target. More recently, the EPA reported that Ireland is set to fall far short of all of its carbon emissions reduction targets for 2030, despite climate action measures in the National Development Plan (EPA, June 2019). As such, the proposed Derrinlough wind energy development is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels.

The need for the proposed project is driven by the following factors:

- 1. A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;*
- 2. A requirement to increase Ireland's national energy security as set out in the Energy White Paper;*
- 3. A requirement to diversify Ireland's energy sources, with a view to achievement of national renewable energy targets and an avoidance of significant fines from the EU (the EU Renewables Directive);*
- 4. Provision of cost-effective power production for Ireland which would deliver local benefits; and*
- 5. Increasing energy price stability in Ireland through reducing an over reliance on imported gas.*

The Climate Action Plan 2019 (CAP) was published on the 1st of August 2019 by the Department of Communications, Climate Action and Environment (DoCCAE). The CAP sets out an ambitious course of action over the coming years to address the impacts which climate may have on Ireland's environment, society, economic and natural resources. This Plan clearly recognises that Ireland must significantly step up its commitments to tackle climate disruption. The CAP identifies a need for 8.2GW of onshore wind generation. Only 3.7GW is in place as of December 2019, therefore Ireland needs to more than double its installed capacity of wind generation. The CAP presents clear and unequivocal support for the provision of additional renewable energy generation and presents yet further policy support for increased wind energy. Further information relating to the Climate Action Plan can be found in Chapter 2, Section 2.4.5.

. Section 2.4 in Chapter 2 of this EIAR on Background to the Proposed Development, presents a full description of the international, national and regional renewable energy policy context for the proposed project. Section 2.4 addresses climate change, including Ireland's current status with regard to meeting greenhouse gas emission reduction targets.

1.5.2 Climate Change and Greenhouse Gas Emissions

At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal the Paris Agreement. The Paris Agreement sets out a global action plan to avoid dangerous climate change by limiting global warming to well below 2°C

above pre-industrial levels. Under the Paris Agreement, the EU and Governments also agreed on the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries and to undertake rapid reductions thereafter in accordance with the best available science.

The International Panel on Climate Change (IPCC) has put forward its clear assessment that the window for action on climate change is rapidly closing and that renewable energy sources such as wind will have to grow from 30% of global electricity at present to 80% by 2050 if we are to limit global warming to below 2 degrees¹ and in accordance with the COP 21 agreement to limit global warming to well below 2°C above pre-industrial levels.

In this regard, the Government enacted the Climate Action and Low Carbon Development Act 2015, which provides for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy.

The Energy White Paper, published by the Government in 2015, notes that “The use of renewables in electricity generation in 2014 reduced CO₂ emissions by 2.6 Mt and avoided €255 million in fossil fuel imports”.

It is estimated that the proposed renewable energy development with a potential output of approximately 88.2MW from the proposed wind turbines. The proposed development will result in the net displacement of between approximately 90,000 and 170,000 tonnes of Carbon Dioxide (CO₂) per annum, depending on the fuel source to which it is compared. The carbon offsets resulting from the proposed development are described in detail in Section 10.2.3 of Chapter 10: Air and Climate.

1.5.3 Energy Security

At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. In 2015, the cost of all energy imports to Ireland was approximately €4.6 billion, with Ireland being one of the most energy import-dependent countries in the European Union, importing 88% of its fuel that year, up from 85% in 2014. This fell to €3.4 billion in 2016 (due mainly to reduced gas imports), rose to approximately €4 billion in 2017 and to approximately €5 billion in 2018. Ireland’s import dependency in 2018 was 67%, down 21% from 2015, however, Ireland is still one of the more import dependent countries in the EU, with the EU average being just over 50% (‘Energy in Ireland 2019’, SEAI, 2019).

Ireland continues to be hugely energy import-dependent leaving it exposed to large energy price fluctuations as a minimum and possibility of fuel shortages if a major energy crisis were to occur. The international fossil fuel market is growing increasingly expensive and is increasingly affected by international politics which can add to price fluctuations. This volatility will be increased as carbon prices increase in the future. This has implications for every Irish citizen.

The SEAI has stated that our heavy dependence on imported fossil fuels “is a lost opportunity in terms of keeping this money here in Ireland and further developing our abundant renewable resources”.

The cost of carbon credits is included in all electricity traded, and the price of electricity generated by coal is particularly vulnerable due to its high carbon emissions per unit of electricity generated. Coal still generates almost 25% of Ireland’s electricity, but the Programme for Government² called for a review of options to replace it with low carbon alternatives within a decade. Any steps to reduce this

1 IPCC Fifth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR5 Report

2 Department of Communications, Climate Action and Environment, National Climate Policy, available at: <https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-at-a-national-level/Pages/default.aspx>

dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. The use of Ireland's indigenous energy resources, such as wind, will contribute to a reduction in energy imports.

The Energy White Paper 2015 notes "There will be a substantial increase in the cost of carbon in the short and medium term, through the EU Emissions Trading Scheme". Any steps to reduce dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. As the White Paper notes:

"In the longer term, fossil fuels will be largely replaced by renewable sources".

1.5.4 Competitiveness of Wind Energy

While Ireland has a range of renewable resources, as the White Paper states "[Onshore Wind] is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support."

In fact, the cost of support is more than offset by the fact that adding large quantities of wind to the wholesale market drives down auction prices in any half hour trading period when the wind is blowing, i.e. for 80% of the hours of the year. Wind is capable of an average capacity factor of 31.7%³, which is its average output throughout the year relative to its maximum output. However, wind is generating power at some level for 80% of the hours of the year. EirGrid's website has more detailed information. A Poyry study from 2015 showed that reaching our targets in 2020 would reduce wholesale prices by more than costs of new grid infrastructure, backup and the subsidies paid to wind, resulting in a net saving of €3m per year in 2020. The EU has noted that Ireland has one of the lowest costs of supporting renewables mainly because onshore wind is on a par with the cost of power from conventional generation when a full cost benefit analysis is undertaken.

1.5.5 EU 2020 Renewable Energy Targets

The burning of fossil fuels for energy creates greenhouse gases, which contribute significantly to climate change. These and other emissions also create acid rain and air pollution. Sources of renewable energy that are utilised locally with minimal impact on the environment are necessary to meet the challenges of the future. The EU adopted Directive (2009/28/EC) on the Promotion of the Use of Energy from Renewable Sources in April 2009, which includes a common EU framework for the promotion of energy from renewable sources.

The Directive sets a mandatory national target for the overall share of energy from renewable sources for each Member State. This package is designed to achieve the EU's overall 20:20:20 environmental target, which consists of a 20% reduction in greenhouse gases, a 20% share of renewable energy in the EU's total energy consumption and a 20% increase in energy efficiency by 2020. To ensure that the mandatory national targets are achieved, Member States must follow an indicative trajectory towards the achievement of their target as outlined in Ireland's National Renewable Energy Action Plan (NREAP).

Ireland's mandatory national target is to supply 16% of its overall energy needs from renewable sources by 2020. This target covers energy in the form of electricity (RES-E), heat (RES-H) and transport fuels (RES-T). The contribution of renewables to gross final consumption (GFC) was 11% in 2018, compared to the 2020 target of 16% (Energy in Ireland – 2019 Report, SEAI, December 2019). Furthermore, the Department of Communications, Climate Action & Environment (DoCCA) reported most recently in

³ Energy in Ireland 2019 Report (Table 17) (SEAI, December 2019). Report available at: <https://www.seai.ie/publications/Energy-in-Ireland-2019.pdf>

their ‘Fourth Progress Report on the National Renewable Energy Action Plan’ (December 2017) that Ireland will achieve 13% of its 16% RES target by 2020.

For RESE alone, Ireland has set a national target of 40% by 2020 as outlined in NREAP. Government policies identify the development of renewable energy, including wind energy, as a primary strategy in implementing national energy policy.

Noted above and further emphasised in the most recent SEAI report, ‘Energy in Ireland – 2019 Report’ (SEAI, December 2019); the share of renewable electricity (RES-E) was recorded at 33.2% in 2018, out of their 40% target; further reporting that Ireland is not on track to meet its 2020 renewable energy target.

More recently, new analysis from EirGrid, has shown that 32% of electricity demand in Ireland during 2018 was met by renewable sources⁴. This shows a positive increase in renewable energy in Ireland from that previously recorded in 2017, but still highlights a shortfall relative to the 2020 target and the significant progress required to meet our targets and beyond 2020.

1.5.6 EU 2030 Renewable Energy Targets

In March 2019, the Minister for Communications, Climate Action & Environment, Richard Bruton, announced a renewable electricity target of 70% by 2030 for Ireland. This commitment will also form part of a new Climate Action Plan that is being overseen by the Government and targeted to make it into Ireland’s National Energy & Climate Plan by the end of 2019. The Joint Committee on Climate Change Action recommended in their recent report, ‘Climate Change: A Cross- Party Consensus for Action’ (March 2019), that new climate change legislation be enacted by the Oireachtas in 2019 to include:

- › A target of net zero economy-wide GHG emissions by 2050;
- › A provision for a 2030 target, consistent with the GHG emissions reduction pathway to 2050 to be set by 2020 by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council;
- › Provision for five-yearly carbon budgets, consistent with the emissions reduction pathway to 2030 and 2050 targets, to be set by Statutory Instrument requiring the formal approval of both Houses of the Oireachtas following receipt of advice from the Climate Action Council; and
- › A target for the renewable share of electricity generation of 70% by 2030.

As noted previously, Ireland will not meet its 2020 renewable energy targets. It is now more critical than ever that we continue to progress renewable energy development in Ireland so that we are successful in meeting our 2030 target. Further detail on the EU 2030 targets is noted in Chapter 2, Section 2.4.

1.5.7 Reduction of Carbon Emissions and Other Greenhouse Gases

This production of renewable energy will assist in achieving the Government’s and EU’s stated goals of ensuring safe and secure energy supplies, promoting an energy future that is sustainable and competitively priced to consumers whilst combating energy price volatility and the effects of climate change. The Energy White Paper in 2015 outlines an ambitious Greenhouse gas reduction target of between 80% to 95% compared to 1990 levels out to 2050. Furthermore, if national carbon emissions

⁴ <http://www.eirgridgroup.com/newsroom/renewables-demand-record/index.xml>

targets are divided out amongst each county, each Local Authority may be responsible for meeting its own targets.

Recent EU and World Health Organisation reports estimate that poor air quality accounted for premature deaths of almost 600,000 people in Europe in 2012⁵. In Ireland, the premature deaths attributable to air pollution are estimated at 1,200 people as outlined in ‘Ireland’s Environment – An Assessment’ (EPA, 2016.) The report states that the pollutants of most concern are NO_x, (the collective term for the gases nitric oxide and nitrogen dioxide, PM (particulate matter) and O₃ (ozone). The EPA report goes on to state that:

“Ireland has considerable renewable energy resources, only a fraction of which are utilised to address our energy requirements.

*Wind, ocean, solar, hydro and geothermal energy do not produce GHG (greenhouse gas) emissions or emissions of air pollutants such as particulates, sulphur dioxide and nitrogen dioxide. Use of these renewable resources can have **considerable co-benefits for human health and ecosystems**. Meeting energy requirements from renewable resources can provide significant economic and employment benefits at local to national scales.”*

The proposed development therefore represents an opportunity to further harness Ireland’s significant renewable energy resources, with valuable benefits to air quality and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to our air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO₂), oxides of nitrogen (NO_x), and sulphur dioxide SO₂, thereby resulting in cleaner air and associated positive health effects.

1.5.8 Economic Benefits

In addition to helping Ireland avoid significant fines and reducing environmentally damaging emissions, the proposed project will have significant economic benefits. At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. As detailed above, in 2018 the cost of all energy imports to Ireland was approximately €5 billion with imported fossil fuels accounting for 67% of all energy consumed (‘Energy in Ireland 2019’, SEAI, 2019).

The SEAI report ‘Energy in Ireland 2019’ indicated that renewable electricity (mostly wind energy) during 2018 and compared to 2016:

- › Displaced €130 million in fossil fuel imports;
- › Reduced CO₂ emissions by 4 million tonnes; and
- › Did not add to consumer bills.

The 2014 report ‘The Value of Wind Energy to Ireland’, published by Póry, stated that growth of the wind sector in Ireland could support 23,850 jobs (construction and operational phases) by 2030. If Ireland instead chooses to not develop any more wind, then by 2030 the country will be reliant on natural gas for most of our electricity generation, at a cost of €671 million per annum in fuel import costs.

The proposed development will be capable of providing power to supply approximately 58,315 households every year, as presented in the calculations in Section 4.3.1.6 of Chapter 4: Description of the Proposed Development of this EIAR.

⁵www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2014/03/almost-600-000-deaths-due-to-air-pollution-in-europe-new-who-global-report

At a Regional Level, the proposed development will help to supply the rising demand for electricity, resulting from renewed economic growth. The ‘All-island Generation Capacity Statement 2017 – 2026’ (SONI and Eirgrid, 2017) notes that electricity demand on the island of Ireland is expected to grow by 17% over the next ten years. Much of this growth is expected to come from new data centres in Ireland.

The proposed development will have several significant long-term and short-term benefits for the local economy including job creation, local authority commercial rate payments and a Community Benefit Scheme.

The annual commercial rate payments from the proposed development to Offaly County Council, will be redirected to the provision of public services within Co. Offaly. These services include items such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the proposed project will create approximately 100-120 jobs during the construction, operational and maintenance phases of the proposed development. During construction, additional employment will be created in the region through the supply of services and materials to the development. In addition to this, there will also be income generated by local employment from the purchase of local services i.e. travel and lodgings.

There are substantial opportunities available for areas where wind farms and other types of renewable energy developments are located, in the form of Community Gain Funds. Based on the current proposal, a Community Gain Fund in the region of €10 million will be made available over the lifetime of the project. The value of this fund will be directly proportional to the installed capacity and/or energy produced at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Further details on the proposed Community Gain proposals are presented in Section 4.5 and Appendix 2.3 of this EIAR.

1.6

Recreational Benefits

In addition to the economic and environmental benefits of the proposed development, there will be potential social and recreational benefits associated with the proposed Recreational Amenity pathway.

The proposed development and all its associated infrastructure creates a unique opportunity to develop an amenity area for use by members of the local and wider community alike. The peatland habitat at both Clongawny and Drinagh Bogs is attractive to both locals and visitors to the area because of its history and variety of vegetation. Sections of the new site roads of the proposed development will be developed and promoted for walking and cycling activities. This proposal is based on the current use of the wider area as an informal walking route; where the proposed amenity facilities will allow for a safer and improved visitor experience and allow the site to be more openly available to walkers, trail runners, cyclists and other recreational users, as outlined in Section 4.6 and Appendix 4.4 of this EIAR. The proposed development will also facilitate linkages to the wider area and to both existing and proposed amenity walkways.

This will provide a long-term benefit to both the local community and visitors to the area.

1.7

Purpose and Scope of the EIAR

The purpose of this EIAR is to document the current state of the environment in the vicinity of the proposed development site and to quantify the likely significant effects of the proposed development on the environment in accordance with the requirements of the EIA Directive, as amended. The compilation of this document served to highlight any areas where mitigation measures may be

necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the proposed development.

It is important to distinguish the Environmental Impact Assessment (EIA) to be carried out by An Bord Pleanála, from the EIAR and the accompanying planning application. The EIA is the assessment carried out by the competent authority, which includes an examination that identifies, describes and assesses in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11 of the Environmental Impact Assessment Directive, the direct and indirect effects of the proposed development on the following:

- › Population and Human Health,
- › Biodiversity,
- › Land, Soil, Water, Air, Climate,
- › Material Assets, Cultural Heritage and the Landscape
- › Interactions between these factors.

The EIAR submitted by the applicant provides the relevant environmental information to enable the EIA to be carried out by the competent authorities. The information to be contained in the EIAR is prescribed Article 5 of the revised EIA Directive described in Section 1.4 above.

1.8

Structure and Content of the EIAR

Volume 1 of this EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the proposed development thereon and the proposed mitigation measures. Background information relating to the proposed development, scoping and consultation undertaken and a description of the proposed development are presented in separate sections. The grouped format sections describe the impacts of the proposed development in terms of human beings, biodiversity, soils and geology, hydrology and hydrogeology, air and climate, noise and vibration, landscape and visual, cultural heritage and material assets such as traffic and transportation, together with the interaction of the foregoing.

The chapters of this EIAR are as follows:

- › Introduction
- › Background to the Proposed Development
- › Consideration of Reasonable Alternatives
- › Description of the Proposed Development
- › Population and Human Health
- › Biodiversity (excluding Birds)
- › Ornithology
- › Land, Soils and Geology
- › Hydrology and Hydrogeology
- › Air and Climate
- › Noise and Vibration
- › Landscape and Visual
- › Archaeological, Architectural and Cultural Heritage
- › Material Assets (including Traffic and Transport, Telecommunications and Aviation)
- › Interactions of the Foregoing
- › Schedule of Mitigation and Monitoring Measures

The EIAR also includes a Non-Technical Summary, which is a condensed and easily comprehensible version of the EIAR document. The non-technical summary is laid out in a similar format to the main EIAR document and comprises a description of the proposed development followed by the existing environment, impacts and mitigation measures presented in the grouped format.

The photomontage booklet pertaining to Chapter 12: Landscape and Visual is included as Volume 2 of this EIAR.

Appendices to the chapters listed above are included in Volume 3 of this EIAR.

1.8.1 Description of Likely Significant Effects and Impacts

As stated in the Draft *‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’* (EPA, 2017), an assessment of the likely impacts of a proposed development is a statutory requirement of the EIA process. The statutory criteria for the presentation of the characteristics of potential impacts requires that potential significant impacts are described with reference to the extent, magnitude, complexity, probability, duration, frequency, reversibility and trans-frontier nature (if applicable) of the impact.

The classification of impacts in this EIAR follows the definitions provided in the Glossary of Impacts contained in the following guidance documents produced by the European Commission (EC) and the Environmental Protection Agency (EPA):

- › *‘Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report’* (EC, 2017)
- › *‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports – Draft August 2017’* (EPA, 2017).
- › *‘Revised Guidelines on the Information to be contained in Environmental Impact Statements – Draft September 2015’* (EPA, 2015)
- › *‘Advice Notes for Preparing Environmental Impact Statements – Draft September 2015’* (EPA, 2015).
- › *‘Advice Notes on Current Practice in the Preparation of Environmental Impact Statements’* (EPA, 2003)
- › *‘Guidelines on the Information to be contained in Environmental Impact Statements’* (EPA, 2002)

Table 1.2, below, presents the glossary of impacts as published in the EPA guidance documents. Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a proposed development on the receiving environment. The use of pre-existing standardised terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across all disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the proposed development on the receiving environment.

Table 1.2 Impact Classification Terminology (EPA, 2017)

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
	Profound	An effect which obliterates sensitive characteristics
Extent and Context	Extent	Describe the size of the area, number of sites and the proportion of a population affected by an effect
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions
Probability	Likely	Effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented
	Unlikely	Effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented

Impact Characteristic	Term	Description
Duration and Frequency	Momentary	Effects lasting from seconds to minutes
	Brief	Effects lasting less than a day
	Temporary	Effects lasting less than a year
	Short-term	Effects lasting one to seven years
	Medium-term	Effects lasting seven to fifteen years
	Long-term	Effects lasting fifteen to sixty years
	Permanent	Effect lasting over sixty years
	Reversible	Effects that can be undone, for example through remediation or restoration
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Type	Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	‘Do Nothing’	The environment as it would be in the future should the subject project not be carried out
	Worst Case’	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents

Each impact is described in terms of its quality, significance, extent, duration and frequency and type, where possible. A ‘Do-Nothing’ impact is also predicted in respect of each environmental theme in the

EIAR. Residual impacts are also presented following any impact for which mitigation measures are prescribed. The remaining impact types are presented as required or applicable throughout the EIAR.

Any potential interactions between the various aspects of the environment assessed throughout this EIAR are presented in Chapter 15: Interaction of the Foregoing.

1.9 Project Team

1.9.1 Project Team Responsibilities

The companies and staff listed in Table 1.3 EIAR Project Team were responsible for completion of the EIAR of the proposed development. Further details regarding project team members are provided below.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. The qualifications and experience of the principal staff from each company involved in the preparation of this EIAR are summarised in Section 1.8.2 below. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. Further details on project team expertise are provided in the Statement of Authority at the beginning of each impact assessment chapter.

Table 1.3 EIAR Project Team

Consultants	Principal Staff Involved in Project	EIAR Input
MKO Tuam Road Galway	Brian Keville Michael Watson Jimmy Green Eoin McCarthy Pat Roberts Dervla O’ Dowd Pdraig Cregg David McNicholas John Hynes Julie O’Sullivan Dr. Úna Nealon David Naughton Ian Hynes Joanna Mole Owen Cahill Eoin Gilson Aoife Joyce Paul Sweeney James Newell Joseph O’Brien	Project Managers, Scoping and Consultation, Preparation of Natura Impact Statement and the following Chapters: > 1. Introduction > 2. Background to the Proposed Development > 3. Consideration of Reasonable Alternatives > 4. Description of the Proposed Development > 5. Population and Human Health > 6. Biodiversity > 7. Ornithology > 10. Air and Climate > 12. Landscape and Visual > 14. Material Assets (non-Traffic) > 15. Interaction of the Foregoing > 16. Schedule of Mitigation Measures

Consultants	Principal Staff Involved in Project	EIAR Input
Hydro Environmental Services 22 Lower Main Street Dungarvan Co. Waterford	Michael Gill David Broderick Adam Keegan	Flood Risk Assessment, Drainage Design and Preparation of the following Chapters: > 8. Land, Soils and Geology > 9. Hydrology and Hydrogeology
Fehily Timoney & Company The Grainstore Singletons Lane Bagnelstown Co. Carlow	Gerry Kane Paul Jennings Ian Higgins	Preparation of Peat Stability Assessment and Peat and Spoil Management Plan
AWN Consulting The Tecpro Building Clonsgaugh Business & Technology Park Dublin 17	Damian Kelly Dermot Blunnie	Baseline Noise Survey and Preparation of Chapter 11: Noise and Vibration
Tobar Archaeological Services Saleen Midleton Co. Cork	Annette Quinn Miriam Carroll	Preparation of Chapter 13: Archaeological, Architectural and Cultural Heritage
Alan Lipscombe Traffic and Transport Consultants Claran, Headford, Co. Galway	Alan Lipscombe	Preparation of Chapter 14: Material Assets - Traffic and Transport
Tom Gittings - Ecological Consultant	Dr. Tom Gittings	Input and Review of Ornithological and Ecological scope of works; peer review of

Consultants	Principal Staff Involved in Project	EIAR Input
Ecological Consultant 3 Coastguard Cottages Roches Point Whitegate Co. Cork		Biodiversity and Ornithology chapters of the EIAR.

1.9.2 Project Team Members

1.9.2.1 MKO

Brian Keville B.Sc. (Env.)

Brian Keville has over 17 years’ professional experience as an environmental consultant having graduated from the National University of Ireland, Galway with a first class honours degree in Environmental Science. Brian was one of the founding directors of environmental consultancy, Keville & O’Sullivan Associates Ltd., prior to the company merging in 2008 to form McCarthy Keville O’Sullivan Ltd., and whom recently rebranded as MKO (March 2019). Brian’s professional experience has focused on project and environmental management, and environmental impact assessments. Brian has acted as project manager and lead-consultant on numerous environmental impact assessments, across various Irish counties and planning authority areas. These projects have included large infrastructural projects such as roads, ports and municipal services projects, through to commercial, mixed-use, industrial and renewable energy projects. The majority of this work has required liaison and co-ordination with government agencies and bodies, technical project teams, sub-consultants and clients.

Michael Watson, MA; Miema CEnv PGeo

Michael Watson is Project Director and head of the Environment Team in MKO. Michael has over 18 years’ experience in the environmental sector. Following the completion of his Master’s Degree in Environmental Resource Management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental and hydrogeological consultancy prior to joining MKO in 2014. Michael’s professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and industrial sectors nationally. Michael’s key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Michael is a key member of the MKO senior management team and as head of the Environment Team has responsibilities to mentor various grades of team members, foster a positive and promote continuous professional development for employees. Michael also has a Bachelor of Arts Degree in Geography and Economics from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and Professional Geologist (PGeo).

Jimmy Green BA, MRUP; MIPI

Jimmy Green holds the position of Senior Planner in MKO and has a wide range of experience in project management and coordination, planning research, analysis, and retail planning. Jimmy has extensive planning experience in both the public and private sectors having worked as an Assistant Planner in Donegal County Council and subsequently as both an Executive and Senior Executive Planner in Galway County Council prior to joining private practice in October 2004. Since moving into the private sector he has provided consulting services to a wide range of private and public sector clients, and his experience includes planning application project management, environmental impact assessment preparation, retail impact assessment, development potential reporting, preparation of linguistic impact statements and submissions to Development Plans/Local Area Plans. Jimmy has a Bachelor of Arts Degree in Human and Physical Geography from National University Ireland Galway and a Masters in Regional and Urban Planning from University College Dublin. Jimmy is also a corporate member of the Irish Planning Institute.

Eoin McCarthy B.Sc. (Env.)

Eoin is Senior Environmental Scientist with McCarthy O'Sullivan Ltd. with over 8 years of experience in private consultancy. Eoin holds B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin took up his position with McCarthy Keville O'Sullivan in June 2011. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment. Eoin's main area of expertise in terms of project management is in the wind energy sector. He has overseen some of the largest SID Wind Energy Projects in Ireland in recent years. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. He has held the role of project manager on over 500MW worth of wind energy projects, with more projects in the pipeline. Within MKO Eoin plays a large role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

Pat Roberts B.Sc. (Env.)

Pat Roberts is a Senior Ecologist and director of the Ecology team with McCarthy O'Sullivan Ltd. with over 12 years post graduate experience of providing ecological services in relation to a wide range of developments at the planning, construction and monitoring stages. Pat holds B.Sc.(Hons) in Environmental Science. Pat has extensive experience of providing ecological consultancy on large scale industrial and civil engineering projects. He is highly experienced in the completion of ecological baseline surveys and impact assessment at the planning stage. He has worked closely with construction personnel at the set-up stage of numerous construction sites to implement and monitor any prescribed best practice measures. He has designed numerous Environmental Operating Plans and prepared many environmental method statements in close conjunction with project teams and contractors. He has worked extensively on the identification, control and management of invasive species on numerous construction sites. Prior to taking up his position with MKO in June 2005, Pat worked in Ireland, USA and UK as a Tree Surgeon and as a nature conservation warden with the National Trust (UK) and the US National Park Service. Pat's key strengths include his depth of knowledge and experience of a wide range of ecological and biodiversity topics and also in his ability to understand the requirements of the client in a wide range of situations. He currently manages the ecological team within MKO and ensures that the outputs from that team are of a very high standard and meet the requirements of the clients and relevant legislation and guidelines. He is a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM).

Dervla O'Dowd B.Sc. (Env.)

Dervla O'Dowd is a Senior Ecologist and Project Manager with McCarthy O'Sullivan Ltd. with twelve years of experience in environmental consultancy. Dervla graduated with a first class honours B.Sc. in Environmental Science from NUI, Galway in 2005 and joined Keville O'Sullivan Associates in the same

year. Dervla has gained extensive experience in the project management and ecological assessment of the impacts of various infrastructural projects including wind energy projects, water supply schemes, road schemes and housing developments nationwide and has also been involved in the compilation of Environmental Impact Statements, with emphasis on sections such as Flora and Fauna, and acted as EIS co-ordinator on many of these projects. Dervla has also provided site supervision for infrastructural works within designated conservations areas, in particular within aquatic habitats, and has also been involved in the development of environmental/ecological educational resource materials and major ecological surveys of inland waterways. Currently, Dervla is responsible for coordinating ecological work, in particular ornithological surveys required on major infrastructural projects, with emphasis on wind energy projects. Dervla's key strengths and areas of expertise are in project management, project strategy, business development and survey co-ordination to ensure the efficient operation of the Ornithology team's field survey schedule. Dervla holds full membership of the Chartered Institute of Ecology and Environmental Management.

Padraig Cregg B.Sc. (Zoo.), M.Sc. (Eco.)

Padraig Cregg is a Senior Ornithologist with McCarthy O'Sullivan Ltd. with over 8 years of experience in both private practice and NGOs. Padraig holds a BSc (Hons) in Zoology and Masters in Evolutionary and Behavioural Ecology. Prior to taking up his position with McCarthy Keville O'Sullivan in December 2018, Padraig worked as a Senior Ornithologist and held previous posts with TOBIN Consulting Engineers, Energised Environments Ltd in Scotland, WSP Environment and Energy Ltd in Scotland and BirdWatch Ireland. Padraig has specialist knowledge in designing, executing and project managing ornithological assessments, primarily in the renewable industry. Padraig's key strengths and areas of expertise are in ornithology and ecology surveying and in writing Natura Impact Statements (NIS) and the Biodiversity chapter of Environmental Impact Assessment Reports (EIAR) to accompany planning applications. Since joining MKO Padraig has been involved in designing, executing and project managing the ornithological assessment on over 20 proposed wind farm developments. He has played a key role in project managing these planning applications through the statutory planning system, with more projects in the pipeline. Within MKO Padraig plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIAR and NIS Reports.

John Hynes M.Sc. (Ecology), B.Sc.

John Hynes is a Senior Ecologist with McCarthy O'Sullivan Ltd. with over 7 years of experience in both private practice and local authorities. John holds a B.Sc. in Environmental Science and a M.Sc. in Applied Ecology. Prior to taking up his position with MKO in March 2014, John worked as an Ecologist with Ryan Hanley Consulting Ltd. and Galway County Council. John has specialist knowledge in Flora and Fauna field surveys, Geographic Information Systems, data analysis, Appropriate Assessment, Ecological Impact Assessment and Environmental Impact Assessment. John's key strengths and areas of expertise are in project management, GIS and impact assessment. Since joining MKO John has been involved as a Senior Ecologist on a significant range of energy infrastructure, commercial, national roads and private/public development projects. Within MKO John plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS Reports. John has project managed a range of strategy and development projects across the Ireland and holds CIEEM membership.

David McNicholas B.Sc. (Env.), M.Sc. (EHSM)

David McNicholas is a Senior Ecologist at McCarthy Keville O'Sullivan, Planning & Environmental Consultants. David holds a BSc (First Class Hons) Environmental Science and an MSc (Hons) Environmental, Health and Safety Management. David has 9 years' professional ecological consultancy experience. David specialises in the preparation of EIAs, EcIAs and NISs including ecological surveys and monitoring. David has worked on all phases of wind farm development from feasibility/ scoping, ecological surveys, preparation of full EIS chapters, construction phase environmental monitoring and post-construction ecological monitoring. David has worked as an Ecological Clerk of Works (ECoW)

during the construction phase of ten large scale wind farms in Ireland and Northern Ireland, gained significant experience on the implementation of the environmental and ecological measures. David is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

Julie O’Sullivan, B.Sc. M.Sc.

Julie is an Ecologist with MKO. She holds a BSc (Hons) in Biology from University College London and a Masters in Ecological Assessment from University College Cork. Prior to taking up her position with MKO, Julie gained experience in practical habitat management and developed a range of field skills in plant, habitat, bird and bat surveying through working with several conservation organisations in the UK and Ireland including the RSPB, Cumbria Wildlife Trust and Bat Conservation Trust. Julie has experience surveying birds through her involvement with the RSPB in Northern Ireland. Julie is trained in bat survey, terrestrial invertebrate and freshwater macroinvertebrate sampling and in taking vegetation relevés of vascular plants and bryophytes. She also has experience in habitat identification, habitat mapping, Annex I habitat quality assessment and Phase 1 habitat survey. Julie has worked within our Ornithology Team on several renewable energy developments, utilising a broad range of bird survey methodologies including vantage point surveys, breeding raptor, adapted brown and shepherd and waterfowl distribution surveys. Julie was part of a team of bird usage surveyors working on the Shannon/Fergus Estuary. Within MKO Julie is responsible for independently carrying out and planning Ornithological field surveys in accordance with required Scottish Natural Heritage standards as part of the ornithology team, and for carrying out bat surveys, habitat surveys, and Appropriate Assessment screenings as part of the ecology team.

Úna Nealon PhD, B.Sc.

Úna Nealon is a Project Ecologist with McCarthy O’Sullivan Ltd. with over 8 years of experience in consultancy, research and conservation management. After gaining a first class honours degree in Environmental Science at NUIG, Úna worked as an Environmental Consultant for OES Consulting where she gained experience in multidisciplinary ecological surveys and impact assessment. In addition, she has held research roles in Tanzania and Madagascar, studying local flora and fauna, and developing conservation management plans. Before joining MKO in June 2016, she completed her PhD with the Centre for Irish Bat Research, examining the impacts of wind farms on Irish bat species. Úna’s primary expertise lies in bat ecology, particularly in relation to wind farm EIA. Beyond this, she is a skilled general ecologist, with experience in flora identification, habitat classification, GIS mapping, mammal surveys, Ecological Impact Assessment and Appropriate Assessment. Since joining MKO, Úna has been responsible for managing bat survey requirements for a variety of wind and solar energy planning applications, as well as other commercial, residential and infrastructure projects. This includes scope development, roost assessments, acoustic surveying, sonogram analyses, impact assessment and report writing. Within MKO, she works as part of a multi-disciplinary team to quickly identify potential ecological constraints and to produce EIS Reports, Appropriate Assessment Screening Reports and Natura Impact Statements. Úna is a member of the Irish Ecological Association, Bat Conservation Ireland and is Secretary of Galway Bat Group.

David Naughton B.Sc. (Env.)

David Naughton is an Ecologist with two years of professional experience, working within the Ornithology Department for MKO. David graduated with an honours B.Sc. degree in Environmental Science from NUIG in 2016. David has a wide range of ecological experience including bird surveys, vegetation surveys, terrestrial invertebrate surveys, freshwater invertebrate surveys, river surveys for salmonids and other fish species, small mammal surveys and habitat identification. David is also very accomplished in GIS software systems for use in interpreting ecological data. David has experience in report writing and has been involved the production of several EIS/EIARs for various windfarm projects as well as numerous interim bird survey reports issued to clients on an ongoing basis. David has also been responsible for the production of collision risk modelling for bird activities at several windfarm sites over the past year, many of which have been peer reviewed by experts in CRM and were found to be appropriate. David’s key strengths and areas of expertise are applications of GIS

systems, including viewshed analysis and collision risk modelling, project management, survey planning and analysing and interpreting large scale datasets. Since joining MKO David has been involved in a wide range of various projects, acting as project manager for many bird survey projects while providing a pivotal contact link between clients and field surveyors.

Ian Hynes B.Sc. (Env.)

Ian Hynes is a Graduate Ecologist with McCarthy Keville and O’Sullivan Ltd., joining in December of 2017. Ian holds a B.Sc. (Hons) in Environmental Science from National University of Ireland, Galway. Ian has a broad knowledge of ecology including invertebrate surveys and identification, vegetation surveys, small mammal surveys and habitat identification. Ian also has over 4 years of experience using GIS software systems including ArcGIS and QGIS and MapInfo to present ecological data. As part of his final year thesis Ian gained valuable experience in report writing, data input, invertebrate and plant identification. Ian also liaised with members of the AranLIFE project and local landowners on Inis Oirr, Aran Islands in the summer of 2016 while completing his thesis. Ian’s key strengths are in Data management and GIS/MapInfo software. Since joining the Ornithology team at McCarthy Keville & O’Sullivan Ltd. He has been involved in a number of windfarm projects, utilising his skills to compile data and create maps for surveys and figures.

Joanna Mole BSc PGDipLA MSc CMLI

Joanna Mole is a Landscape and Visual Impact Assessment Specialist and Chartered Landscape Architect with McCarthy O’Sullivan Ltd. with over 16 years of experience in both private practice and local authorities. Joanna holds a BSc (Hons) in Landscape Design & Plant Science from Sheffield University, a Postgraduate Diploma in Landscape Architecture from Leeds Beckett University, and a MSc in Renewable Energy Systems Technology from Loughborough University. Prior to taking up her position with MKO in October 2017, Joanna worked as a Landscape Architect with Kav-Banof in Israel and held previous posts with CSR in Cork, LMK in Limerick, Geo Architects in Israel and Groundwork Bridgend in South Wales. Joanna is a Chartered Landscape Architect with specialist knowledge in Landscape and Visual Impact assessments for projects ranging from individual houses to large windfarms, cycle route design and landscape contract management. Since joining MKO Joanna has been involved in projects such as energy infrastructure, extraction industry and residential projects. Joanna holds chartered membership of the British Landscape Institute since 1998 and has been an examiner for British Landscape Institute professional practice exam.

Owen Cahill B.Sc., M.Sc.

Owen is an Environmental Engineer with McCarthy O’Sullivan Ltd. with over 11 years of experience in the environmental management and construction industries. Owen holds BSc. (Hons) and MSc. in Construction Management and a Masters in Environmental Engineering. Prior to taking up his position with MKO in October 2013, Owen worked as an Environmental Officer with Kepak and prior to which he held a post with Pentland Macdonald Contaminated Land & Water Specialists in Northern Ireland. Prior to working in planning and environmental consultancy, Owen was employed within the construction industry where he gained significant experience on a variety of civil, residential and commercial projects. Owen’s wide ranging multi sector experience has provided him with specialist knowledge and understanding of the challenges in the planning and delivery of developments with the minimum environmental impact and with practicality and constructability in mind. Owen’s key strengths and areas of expertise are in project management, environmental impact assessment, wind energy and solar energy construction and environmental management planning and waste permit management. Since joining MKO Owen has been involved as a Project Manager on a range of energy infrastructure, commercial, residential, waste facility and quarry projects as well as managing the licensing requirements of a number of EPA licensed facilities. Within MKO Owen plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIS Reports. Owen has project managed the Environmental Impact Assessment of a range of development projects across the Ireland and holds Affiliate Membership with

the Institute of Environmental Management & Assessment and is currently awaiting interview and assessment to become a Full Member and Chartered Environmentalist.

Eoin Gilson B.Sc., M.Sc.

Eoin is an Environmental Scientist with McCarthy O’Sullivan Ltd. who took up his position in October 2018. Eoin holds a BSc (Hons) in Microbiology and a MSc (Hons) in Applied Environmental Science. Eoin has specialist knowledge in environmental field surveys, data analysis and renewable energy systems. Eoin’s key strengths and areas of expertise are in data management, report writing and environmental monitoring and management. On joining MKO Eoin has been involved on a range of renewable energy infrastructure projects, working as part of a large multi-disciplinary team to produce EIA Reports.

Aoife Joyce B.Sc., M.Sc.

Aoife Joyce is a Graduate Ecologist with MKO Planning and Environmental Consultants with experience in research, consultancy and drilling contractors. Aoife is a graduate of Environmental Science (Hons.) at NUI Galway, complemented by a first class honours MSc in Agribioscience. Prior to taking up her position with MKO in May 2019, Aoife worked as an Environmental Scientist with Irish Drilling Ltd. and held previous posts with Inland Fisheries Ireland and Treemetrics Ltd. She has a wide range of experience from bat roost identification, acoustic sampling, soil and water sampling, Waste Acceptability Criteria testing, electrofishing, mammal and habitat surveying to GIS, Environmental Impact Assessments (EIAs) and mapping techniques. Since joining MKO, Aoife has been involved in deploying bat detectors and weather stations nationwide, dawn and dusk bat detection surveys, sound analysis, mapping and report writing. Within MKO, she works as part of a multidisciplinary team to help in the production of ecological reports and assessments. Aoife is a member of Bat Conservation Ireland and Qualifying CIEEM.

Paul Sweeney BA. MSc.

Paul Sweeney is a Graduate Planner with MKO having joined the team in April 2018. Paul holds a BA (Hons) in Geography and English and a Masters in Planning and Sustainable Development from University College Cork where he graduated in 2017. Since joining MKO, Paul has started to develop experience in a range of sectors through various projects and planning issues with a current focus within the Environmental and Energy sector.

James Newell

James holds the position of CAD and Information Technology Technician with MKO since joining the Company in May 2006. Prior to joining MKO, he worked as a graphic designer and illustrator for over eight years. In recent years James’ role has extended to include all wind farm visual modelling completed by the company. He is proficient in the use of MapInfo GIS software in addition to AutoCAD and other design and graphics packages.

Joseph O’Brien

Joseph O’Brien joined MKO in 2016 and holds the position of CAD Technician. Joseph holds a BA Honours Level 8 Modelmaking, Design and Digital Effect, Institute of Art Design and Technology (IADT), Dun Laoghaire & City & Guilds Level 3 2D & 3D AutoCAD certificates. Joseph’s role entails various wind and solar farm projects which require various skills such as mapping, aerial registration and detailed design drawings for projects.

1.9.2.2 Hydro Environmental Services

Michael Gill

Michael Gill is an Environmental Engineer with over ten years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms in Ireland. He has also managed EIA/EIS assessments for infrastructure projects and private residential and commercial developments. In addition, he has substantial experience in wastewater engineering and site suitability assessments, contaminated land investigation and assessment, wetland hydrology/hydrogeology, water resource assessments, surface water drainage design and SUDs design, and surface water/groundwater interactions.

David Broderick

David Broderick is a hydrogeologist with over seven years' experience in both the public and private sectors. Having spent two years working in the Geological Survey of Ireland working mainly on groundwater and source protection studies. David moved into the private sector. David has a strong background in groundwater resource assessment and hydrogeological/hydrological investigations in relation to developments such as quarries and wind farms. David has completed numerous geology and water sections for input into EIAs for a range of commercial developments.

Adam Keegan

Adam Keegan is a hydrogeologist with two years of experience in the environmental sector in Ireland. Adam has been involved in Environmental Impact Assessment Reports (EIARs) for numerous projects including wind farms, grid connections, quarries and small housing developments. Adam holds an MSc in Hydrogeology and Water Resource Management. Adam has worked on several wind farm EIAR projects, including Croagh WF, Lyrenacarriga WF (SID), Cleanrath WF, Carrownagowan WF (SID), and Fossy WF.

1.9.2.3 Fehily Timoney & Company

Fehily Timoney & Company Ltd. (FT) recently acquired AGECE Ltd. adding to their growing geotechnical team. The geotechnical aspects of the project, which have been incorporated into the Land, Soils and Geology Chapter and the Hydrology and Hydrogeology Chapter of the EIAR, were completed by Fehily Timoney & Company Ltd. FT (previously AGECE) has extensive experience in the production of Peat Stability Assessments for wind energy developments. They provide specialist geotechnical engineering and engineering geology advice to local authorities, contractors and consultants, particularly for infrastructure projects forming part of the National Development Plan and also for private commercial and residential developments as they move on to sites with more complex ground conditions.

Gerry Kane

Gerry Kane joined AGECE Ltd. (now part of Fehily Timoney & Company Ltd.) as a Geotechnical Engineer in 2008. Gerry graduated from IT Carlow in 2008 with a BEng (Hons) degree in Civil Engineering. Gerry is a Geotechnical Engineer with over seven years' experience in geotechnical design and analysis, supervision and interpretation of ground investigations, foundation and earthwork design, supervision of construction of bulk earthworks and structure foundations, slope stability analysis, desk studies and walkover surveys. Previous and current experience in the wind energy field has included work for wind farm developments in Ireland, Northern Ireland, Scotland, Wales and England. This work has covered Peat Stability Assessment Reports, Soils and Geology Chapters of EIAR's, site assessments for wind farm developments and the investigation of peat failures at wind farm sites.

Ian Higgins

Ian is a geotechnical engineer with 20 years' experience in the design and supervision of construction of bulk earthworks, geotechnical foundation design, geotechnical monitoring and reviewing, reinforced earth design, slope stability assessments and 3rd party checking of piling and ground improvement designs. Ian's experience also includes the design, supervision and interpretation of ground investigations, including desk studies, walkover surveys, hazard mapping of rock excavations and slopes.

Ian has experience in many areas of civil engineering including highways, railways, energy projects and commercial developments.

1.9.2.4 **AWN Consulting Ltd.**

Damian Kelly

Damian Kelly (Technical Director) holds a B.Sc. from DCU and a M.Sc. from QUB. He has over 20 years' experience as an acoustic consultant and is a Member of the Institute of Acoustics. He has extensive knowledge in the field of noise modelling and prediction, having developed many of the largest and most complex examples of proprietary noise models prepared in Ireland to date. He has extensive modelling experience in relation to wind farm, industrial and road infrastructure projects. He is a sitting member of the committee of the Irish Branch of the Institute of Acoustics.

Dermot Blunnie

Dermot Blunnie (Senior Acoustic Consultant) holds a BEng. from the University of South Wales, a M.Sc. from the University of Derby and IOA Diploma in Acoustics and Noise Control from the Institute of Acoustics. He has over 11 years' experience as an acoustic consultant and is a member of the Institute of Acoustics. He has extensive knowledge and experience in relation to commissioning noise monitoring and impact assessment of wind farms as well as a detailed knowledge of acoustic standards and proprietary noise modelling software packages. He has commissioned noise surveys and completed noise impact assessments for numerous wind farm projects within Ireland.

1.9.2.5 **Tobar Archaeological Services**

Tobar Archaeological Services is a Cork-based company entering its ninth year in business. They offer professional nationwide services ranging from pre-planning assessments to archaeological excavation, and cater for clients in state agencies, private and public sectors.

Tobar's Directors, Annette Quinn and Miriam Carroll, are licensed by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs to carry out excavations in Ireland and have carried out work directly for the National Monuments Services of the Department of the Environment, Heritage and Local Government. Tobar Archaeological Services has a proven track record and extensive experience in the wind farm industry from EIAR stage through to construction stage when archaeological monitoring is frequently required.

1.9.2.6 **Alan Lipscombe Traffic and Transport Consultants**

In January 2007 Alan Lipscombe set up an independent traffic and transportation consultancy providing advice for a range of clients in the private and public sectors.

Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning

Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the NUI Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic and transport modelling, including for numerous wind farm developments, and is an accomplished analyst who has experience of a wide variety of modelling packages and methods.

1.9.2.7 **Dr. Tom Gittings – Ecological Consultant**

Dr Tom Gittings has been trading as an independent ecological consultant since 2001. He has over 24 years' experience as a professional ecologist and is a full member of the Chartered Institute of Ecology and Environmental Management. Tom completed his PhD in Entomology in 1994. From 1995-2001 Tom worked for the RPS Group environmental consultancy, as an Ecological Consultant (1995-1998), Associate Ecologist/Office Manager (1998-2000) and Technical Director (2000-2001). From 2001-2009, Tom carried out research into forest and wetland biodiversity in University College Cork. During this period, Tom also developed a portfolio of independent consultancy work, and, since 2010, he has worked as a full-time independent consultant. Tom has extensive experience in a wide range of ecological disciplines and applications. He has carried out numerous specialist ecological surveys and assessments as well as project managing large-scale Environmental and Ecological Impact Assessments. Since 2010, a major focus of his work has been carrying out research into waterbird interactions with aquaculture and shellfisheries and preparing Appropriate Assessments of coastal SPAs using the results of this research. Other major areas of his work in recent years have included bird surveys for windfarms and powerlines, large-scale habitat surveys, and specialist entomological and ornithological surveys.

1.10 **Difficulties Encountered**

There were no technical difficulties encountered during the preparation of this EIAR.

1.11 **Viewing and Purchasing the EIAR**

Copies of this EIAR will be available online, including the Non-Technical Summary (NTS), on the website of An Bord Pleanála, under the relevant Planning Reference Number (to be assigned on lodgement of the application).

› An Bord Pleanála: <http://www.pleanala.ie/>

This EIAR and all associated documentation will also be available for viewing at the offices of both An Bord Pleanála and Offaly County Council. The EIAR may be inspected free of charge or purchased by any member of the public during normal office hours at the following address:

› An Bord Pleanála,
64 Marlborough Street,
St. Rotunda,
Dublin 1

› Offaly County Council,
Áras an Chontae,
Charleville Road,
Tullamoore,
Co. Offaly

The EIAR will also be available to view online via the Department of Planning, Housing and Local Government's EIA Portal, which will provide a link to the planning authority's website on which the application details are contained. This EIA Portal was recently set up by the Department as an electronic notification to the public of requests for development consent which are accompanied by an EIAR.

<https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>

The EIAR will also be available to view online on its dedicated SID website:
<https://www.derrinloughwindfarmplanning.ie>