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61253

Environmental Impact Assessment

Cummeenabuddoge Wind Farm

Volume 1: Non-Technical Summary

Cummeennabuddoge Wind (DAC)

September 2024

Contents

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Preface

This Non-Technical Summary (NTS) summarises the Environmental Impact Assessment Report (EIAR) which accompanies an application for planning permission for Cummeennabuddoge Wind Farm (the 'Proposed Development') on behalf of Cummeenabuddoge Wind Designated Activity Company (DAC) 'the Applicant'.

The Proposed Development is a Wind Farm of 17 Turbines located on land at Clydaghroe and Cummeennabuddoge (CMBG), Clonkeen, County Kerry.

The Proposed Development is classed as a Strategic Infrastructure Development (SID). Accordingly, the planning application will be determined by An Bord Pleanála ('the Board') although a proportion of the grid connection cabling is proposed within County Cork.

The Applicant is a joint venture between FuturEnergy Ireland (FEI) and SSE Renewables. Both companies have been involved in building and operating wind farm projects in Ireland over the past 10 years and are currently working in a co-development arrangement across a portfolio of electricity generation projects that aim to reduce carbon emissions and contribute to national and international climate change targets.

FEI is a joint venture company owned on a 50:50 basis by Coillte CGA and ESB. This business combines the State's strongest assets and expertise in onshore renewable energy development on behalf of the people of Ireland.

The aim of FEI is to help materially the country deliver on its green energy targets through the development of 1GW of wind energy projects by 2030.

FEI is dedicated to developing commercially successful wind farms while maximising the support from local communities through the creation of jobs in rural areas and funding local development for host communities.

SSE Renewables is a leading developer, owner and operator of renewable energy projects in Ireland with a vision to make renewable energy the foundation of a zero-carbon world. The renewable electricity generated at wind farms operated by SSE Renewables across Ireland powers SSE Airtricity, Ireland's largest provider of 100% green energy.

The company's onshore portfolio in Ireland comprises 29 windfarms producing nearly 700MW of renewable generation, including Ireland's largest wind farm the 174 MW Galway Wind Park.

The planning application (including the EIA Report and this NTS) has been prepared by Atmos Consulting Ltd on behalf of the Applicant.

The EIA Report presents the findings of the assessment of the likely significant environmental effects as a result of the Proposed Development.

The EIA Report consists of the following:

- Volume 1: NTS;
- Volume 2: EIA Chapters;
- Volume 3: Figures; and
- Volume 4: Technical Appendices.

This NTS has been structured to mirror the structure of Volume 2 of the EIA Report with Sections 1-4 providing an introduction to the Proposed Development, the EIA process and the approach to site selection and design as well as a summary of the key components of the Proposed Development itself.

Sections 5 to 17 summarise the findings of the EIA whilst Section 18 summarises the potential interaction between the significant effects and the measures to mitigate those effects identified in the EIA Report.

Copies of the EIAR are available online on the following websites:

- The Applicant's dedicated website: www.cummeennabuddogewindfarm.ie
- The Planning Section of the An Bord Pleanála website (http://www.pleanala.ie/), under the relevant Planning Reference Number (to be assigned by An Bord Pleanála)
- Through the relevant link on the Department of Planning, Housing and Local Government's EIA Portal, (https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eiaportal)

The EIA Report and all associated documentation is also be available for viewing at the offices of both An Bord Pleanála and Kerry County Council. The EIA Report may be inspected free of charge or purchased by any member of the public during normal office hours at the following addresses:

- An Bord Pleanála, 64 Marlborough Street, St. Rotunda, Dublin 1, D01 V902;
- The Offices of Kerry County Council, County Buildings, Ratass, Tralee, Co. Kerry, V92 H7VT; and
- The Offices of Cork County Council, Ground Floor, County Hall, Carrigrohane Road, Cork, T12 R2NC.

1 Introduction

The Proposed Development consists of 17 wind turbines with a maximum ground to blade tip height of between 199.5 metres (m) and 200m and a hub height between 118m 125m. The exact dimensions of the turbines will be dependent on the model selected by the Applicant prior to construction.

The Proposed Development also includes access tracks, an on-site substation meteorological mast, and a 110 kilo Volt (kV) underground electrical connection route to Ballyvouskill substation to the east of the Wind Farm to allow the export of electricity.

Each turbine will have an installed electrical generation capacity of between 6 and 7.2 Mega Watts (MW) giving the Proposed Development a total maximum electricity export capacity of between 102MW and 122.4MW.

A more detailed description of the Proposed Development can be found in Section 1.4 below.

The Proposed Development Site (the land encompassing all the Wind Farm elements) is located on land in the Clydaghroe and Cummeenabuddoge townlands about 20km southeast of Kilarney.

The Proposed Development Site is located entirely within County Kerry except for part of the grid connection between the Wind Farm and Ballyvouskill Substation which is within County Cork.

The nearest settlements are Ballyvourney and Millstreet (both in County Cork) located approximately 5km south of and 7km north east of the Site respectively.

The Proposed Development Site is currently used for commercial forestry and is shown in Figure NTS 1 below.

The Site does not lie within any areas designated for ecological or nature conservation interest. However, the Site immediately adjoins and drains directly into the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation (SAC).

The Proposed Natural Heritage Area (PNHA) of Mullaghanish Bog is directly south of the Site.

The Mullaghanish to Mushera Mountains Special Protection Area (SPA) is within 600m to the east and south of the Site. Hen Harriers are the qualifying interest.

The Proposed Development Site land is designated as a Visually Sensitive Area (to wind development by Kerry County Council as part of the County's Development Plan (2022b).

Figure NTS 2 shows the Proposed Development in the context of existing designated sites, and neighbouring dwellings.

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 1
Site Location Plan

Key

Site boundary

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0 0.5 1 2
Kilometres

N

Scale @ A4:
1:70,000

18/09/2024 61253/SL/076c

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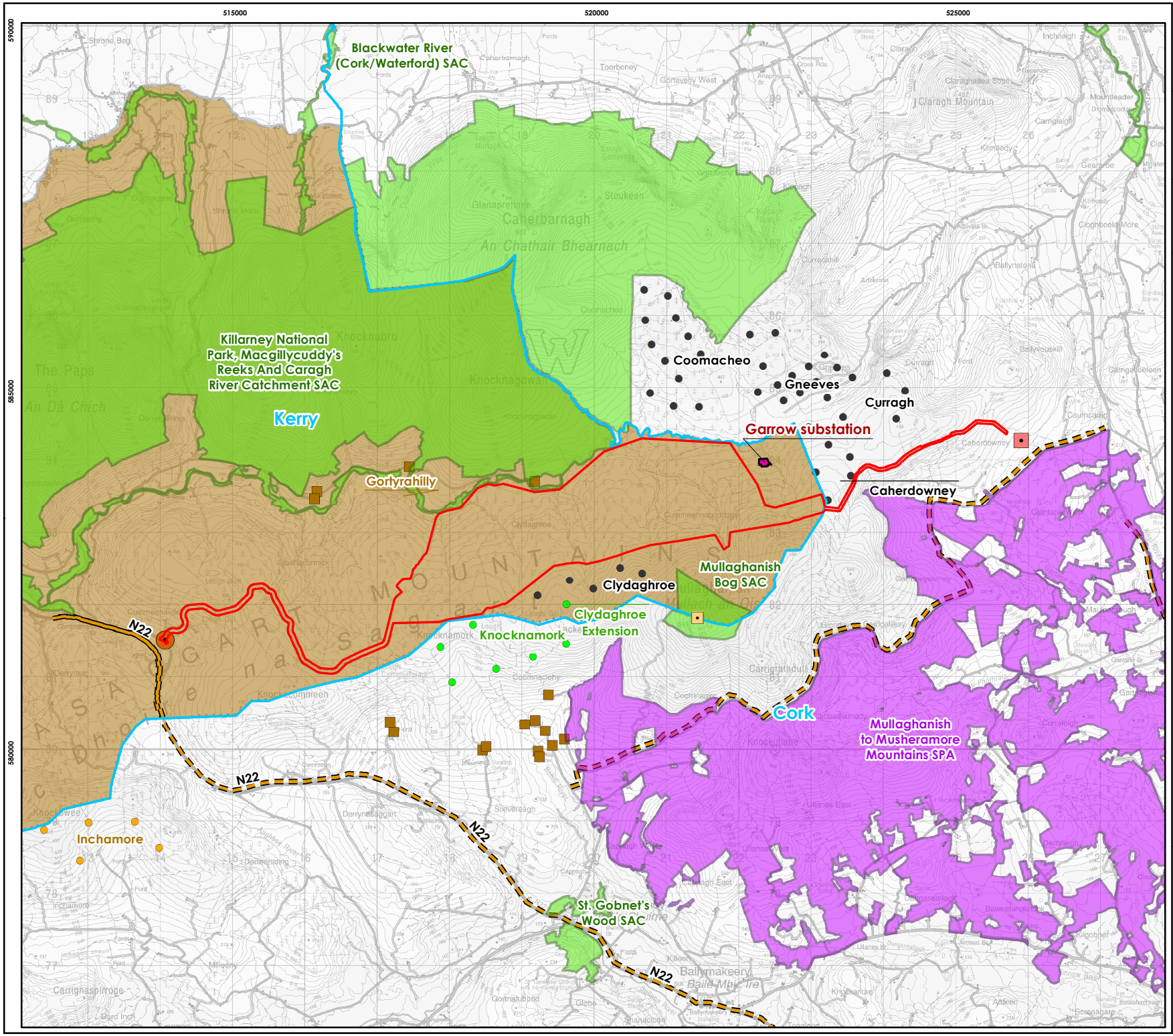
Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 2
Site Context Plan



Key

- Site boundary
- Garrow substation
- Site entrance
- Mullaghanish telecoms mast
- Ballyvouskil Substation
- Dwelling within 4km
- Local Authority Boundaries
- Kerry CC Views and Prospects / Cork CC Scenic Route
- Special Area of Conservation
- Special Protection Area

Cumulative Turbines

- Turbine in planning
- Permitted turbine
- Operational turbine

Local Designations

- Visually Sensitive Area

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Kilometres

N

Scale @ A4: 1:70,000

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1.1 Purpose of the EIA Report

This EIAR presents the findings of the EIA process by describing the Proposed Development, the current conditions at the Proposed Development Site and wider receiving environment and the likely environmental effects which may result from the construction, operation and decommissioning of the Proposed Development.

Where potentially significant effects are identified, measures designed to avoid, reduce or offset those effects are proposed (mitigation measures) are proposed and listed in the EIAR.

The findings and conclusions of the EIA are summarised in this NTS which is intended to allow anyone with an interest in the Proposed Development to understand and access information on its potential environmental effects.

The EIA assesses the direct and indirect significant effects of the Proposed Development in accordance with the EIA Directive[1], specifically:

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

1.2 The EIA Team

The EIA was undertaken by Atmos Consulting with assistance from specialist consultants.

Atmos Consulting has been involved in the development of projects and planning applications since 2007 having successfully managed EIA and planning applications for c.670MW of onshore wind and currently leading the planning process for a further 1GW. Atmos' staff includes a team of specialist EIA Practitioner delivering Environmental Impact Assessments for large and small scale Windfarms.

Each Chapter of the EIAR provides a Statement of Competence for the specialists involved in every assessment.

1.3 Additional Documents

The planning application is accompanied by a Planning Statement which provides an assessment of the Proposed Development against the relevant International, National, Regional and Local Planning and Energy Policies.

The planning application is also accompanied by a Natura Impact Statement This is an assessment of the likely or possible significant effects of the Development on sites designated as Natura 2000 conservation areas, also defined in Irish legislation as

[1] European Council (EC) (1985). Directive on Environmental Assessment (85/337/EEC) as amended by Directive 97/11/EC and Directive 2014/52/EU.

"European sites". It is provided to inform the Board's appropriate assessment under EU Habitats Directive[2].

These documents do not form part of the EIA Report.

1.4 Need for the Development

The Proposed Development is needed to:

- Diversify Ireland's energy sources, to achieve national renewable energy targets;
- Reduce Ireland's dependency on fossil fuels resulting in lower carbon dioxide emissions;
- Increase Ireland's national energy security;
- Increase Ireland's contribution to wider EU renewable energy goals;
- Aid in the acceleration of actions towards the goals of the Sharm el-Sheikh Implementation Plan and the Breakthrough Agenda (COP27); and
- Increase energy price stability in Ireland by reducing an over-reliance on imported gas and exposure to international market price and supply fluctuations.

The need for the Development is discussed further in the accompanying Planning Statement.

[2] Article 6(3) of the EU Habitats Directives (92/43/EEC and 2009/147/EC).

2 EIA Approach and Methodology

2.1 EIA Methodology

The reporting of the assessment of environmental impacts in Chapters 5 to 17 of the EIAR has been undertaken in a consistent, structured format, whereby the potential effects have been identified and their significance assessed.

A two-stage assessment has been undertaken

All assessments include an assessment of the three phases of the Proposed Development as each phase has the potential to give rise to different effects:

- **Construction;** generally temporary/short-term effects that occur during the construction of the Proposed Development;
- **Operation;** Effects resulting from operation of the Proposed Development; and
- **Decommissioning;** Effects arising from the removal of infrastructure and restoration of the site.

In most of the chapters within this EIA Report, the significance of an effect is described as a function of magnitude of effects and sensitivity of the receptor.

Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the competent authority (An Bord Pleanála) is adequately informed of the environmental consequences of permitting a project.

Further specific guidance, legislation and technical standards for describing environmental effects, and pertinent to particular environmental topics, are also described in each individual chapter of this EIAR, as necessary.

Mitigation measures have been considered for each significant adverse effect identified. These measures can include:

- Changes to the Proposed Development design;
- Physical measures applied on site; and
- Measures to control particular aspects of the construction or operation of the Proposed Development.

Wherever possible, mitigation has been developed to ensure that no significant residual (negative) environmental effects are predicted.

2.2 EIA Scoping and Consultation

An informal EIA consultation was undertaken in 2021 to obtain input on the scope of the EIA from An Bord Pleanála, Kerry County Council and other relevant consultees.

This consultation was accompanied by a Scope of Works which described the development, the proposed EIA methodology and key area to be 'scoped in' or 'scoped out' of any further assessment.

The responses to this consultation can be found in the EIA Report Technical Appendix 2-2.

The project Community Liaison Officer's initial engagement with the public commenced in December 2020 and included introductory letters and direct engagement by calling to all the houses within 2 km of the proposed study area.

Between 2021 and 2023, three newsletters were distributed to the local community. Newsletter 1 was also sent to local newspaper journalists, political representatives and community groups. A meeting was held between the project's lead project manager, Community Liaison Officer, local TDs and local councillors.

In March 2023, a project update letter was distributed to households within 4km of the proposed project study area.

A virtual tour and information webinar can be found on the project website.

The applicant held Public Information Days (PIDs) for the Proposed Development on September 20th and 21st 2023 at the Abbey Hotel, Ballyvourney, Co. Cork, P12 FW30.

3 Site Section and Design

The basis of the selection of the site for the Proposed Development was to use land under the stewardship of Coillte. A three-stage selection process was then followed:

1. Screening sites to exclude those that are protected (such as those within National Parks or carrying statutory or biodiversity protection), or have low windspeed (below an average of 7m/s at 80m above ground level);
2. Screening out sites that don't have a feasible grid connection in terms of distance to a suitable connection point and the capacity of that connection point to accommodate the electricity generated by the Proposed Development; and
3. Screening out sites that have other constraints or sensitivity (such as land ownership issues, the presence of other windfarms or significant ecology or landscape sensitivity).

This resulted in the Proposed Development Site being selected as the optimum location.

Once selected, the site was considered for suitability for alternative renewable energy technologies, with solar being the only other potentially viable technology based on the site characteristics.

However, this was ruled out due to the much higher land area needed for the same generation capacity and the associated higher environmental impact.

The windfarm design was started based on the maximum theoretical number of turbines that the site could hold based on the physical and environmental constraints known to present based on the information available at the time.

The Proposed Development design then went through a series of changes to avoid or minimise potential environmental effects as the surveys and assessments progressed.

This included consideration of the effects on views, the water environment (hydrology), peat, ecology and biodiversity, fisheries, ornithology, noise and archaeological features.

Further detail on site selection and the design process can be found in Chapter 3: Design Evolution and Consideration of Alternatives of the EIA Report.

4 Development Description

The Proposed Development consists of 17 turbines up to a maximum 200m tip height above ground level (AGL), a permanent meteorological met mast up to a height of 110m (AGL) and associated infrastructure.

The associated infrastructure includes up to:

- 6.99km upgraded existing access tracks;
- 19.04km new access tracks;
- Construction of turbine foundations and crane hardstandings for each of the 17 turbine;
- 89.7km of underground electricity cabling;
- 3.6km underground electricity cabling to connect the Proposed Development to the National electricity grid at the Ballyvouskil substation;
- Four borrow pits (for the extraction of stone to build access tracks etc.);
- Six peat repository areas;
- Eight watercourse crossings;
- Three temporary construction compounds; and
- One onsite substation.

The layout of the Proposed Development is shown in Figures NTS 3a to 3e below. All of the above infrastructure is contained within the red line boundary shown in that figure

The construction of the Proposed Development will require the delivery of large components such as turbine blades (abnormal loads) to the site from overseas via Ringaskiddy Port then onto the N28, before continuing onto the N40 to the N22.

The passage of the abnormal loads along this route will require some temporary modifications to the roads and street furniture along this route.

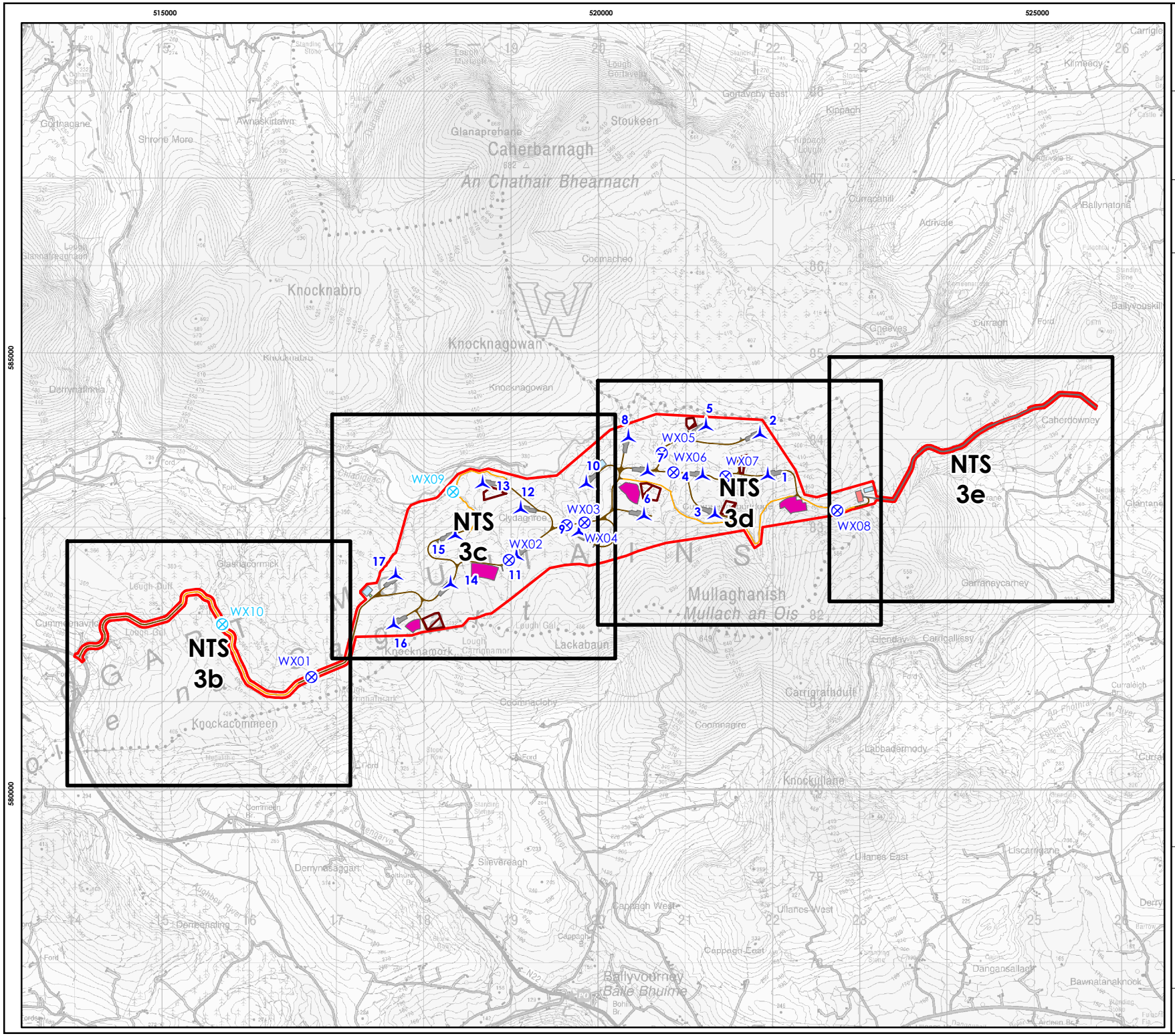
These modifications are detailed in Section 7 below and have been assessed as part of the EIA and are therefore part of the Proposed Development. The abnormal load delivery route is shown on Figure NTS 4 and the location of the proposed modifications are shown on Figure NTS 5.

However, they do not form part of the planning application as they will need separate consent.

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 3a
Site Layout Plan
Overview



Key

- Site boundary
- Proposed Turbine Location
- New watercourse crossing
- Existing watercourse crossing
- Turbine foundation
- Crane hardstanding
- Substation
- Compound
- Met mast hardstanding
- Borrow pit
- Peat repository
- Cable trench
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

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0 500 1,000 2,000
Metres

N

Scale @ A4: 1:58,000

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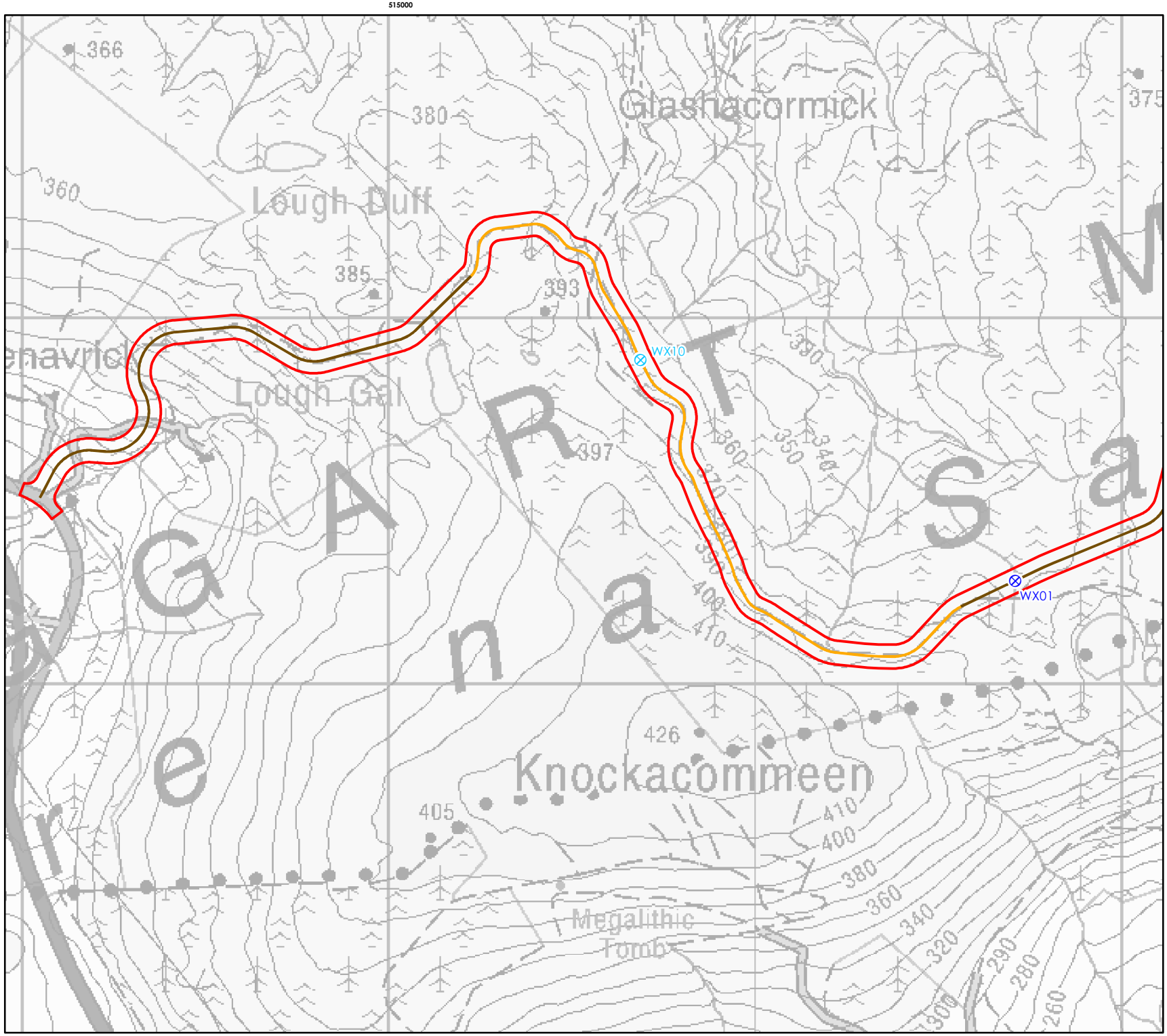

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 3b
Site Layout Plan
Site Entrance and western extent

Key

- Site boundary
- New watercourse crossing
- Existing watercourse crossing
- New onsite access track - Founded
- Upgraded onsite access track

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0 125 250 500
Metres

N

Scale @ A4:
1:14,000

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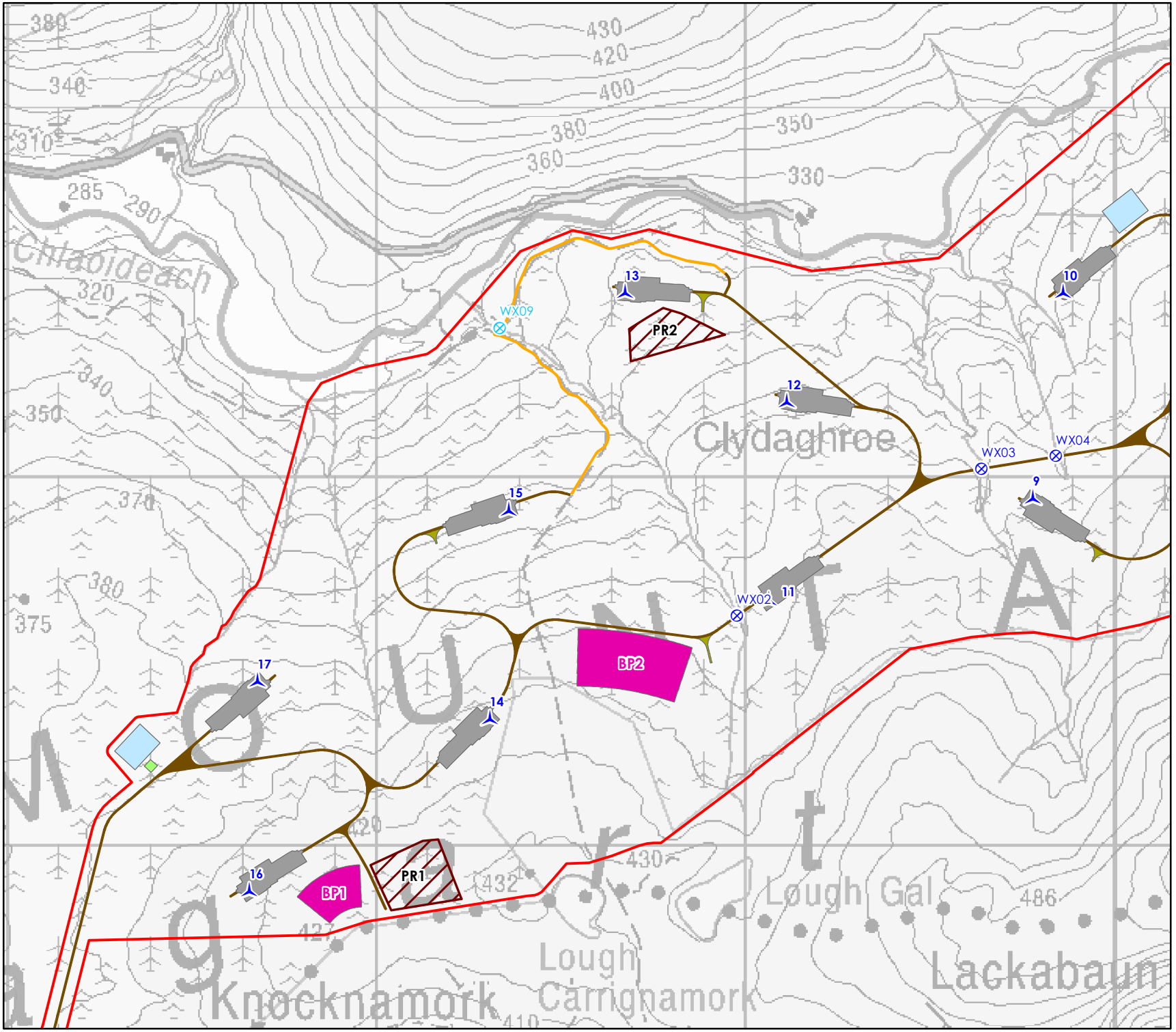

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 3c
Site Layout Plan
Main Site Western extent

Key

- Site boundary
- Proposed Turbine Location
- New watercourse crossing
- Existing watercourse crossing
- Turbine foundation
- Crane hardstanding
- Compound
- Met mast hardstanding
- Borrow pit
- Peat repository
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

atmos CONSULTING

0 125 250 500
Metres

N

Scale @ A4: 1:14,000

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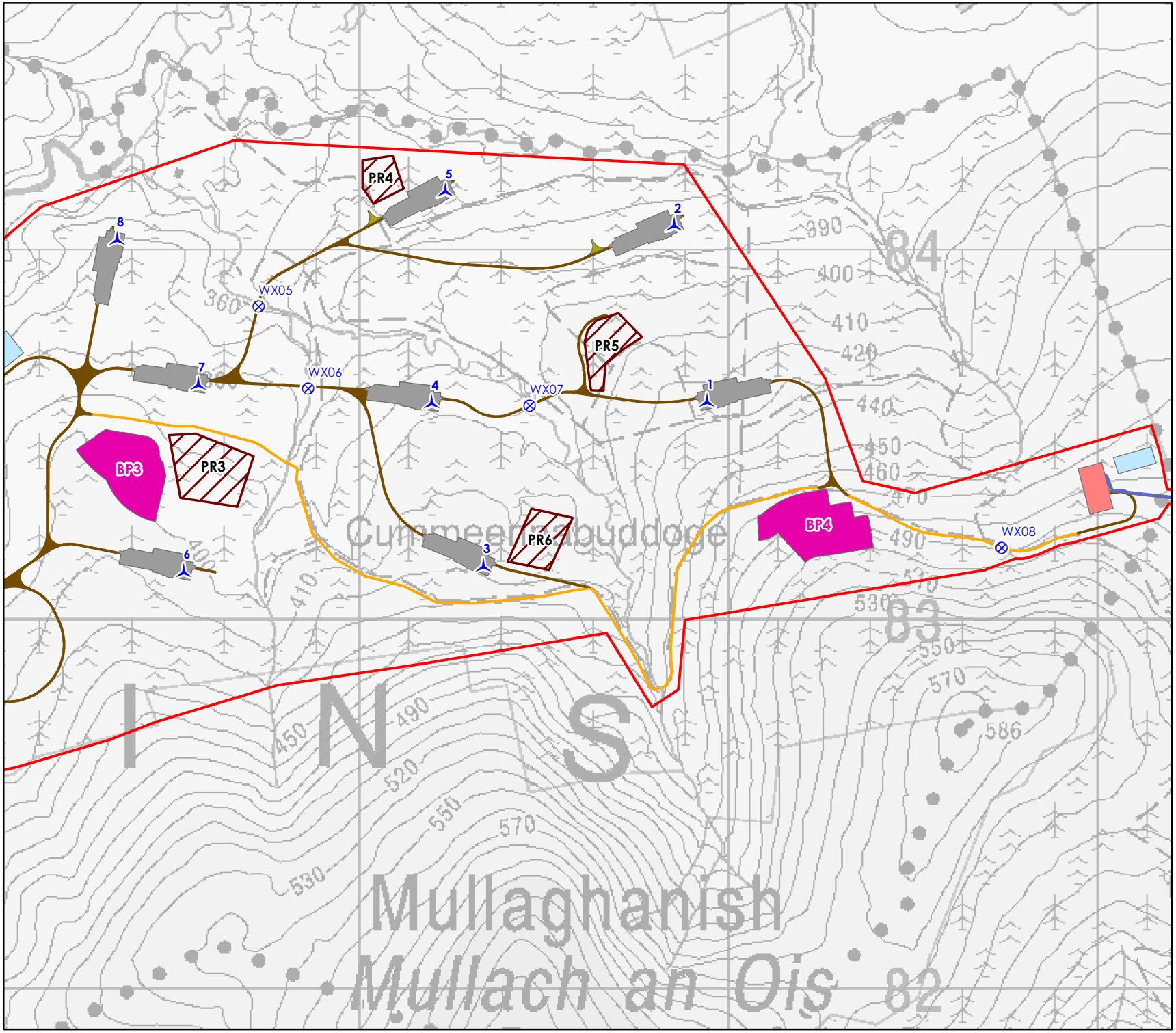
Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 3d
Site Layout Plan
Main Site Eastern extent



Key

- Site boundary
- Proposed Turbine Location
- New watercourse crossing
- Turbine foundation
- Crane hardstanding
- Substation
- Compound
- Borrow pit
- Peat repository
- Cable trench
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

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0 125 250 500
Metres

N

Scale @ A4: 1:14,000

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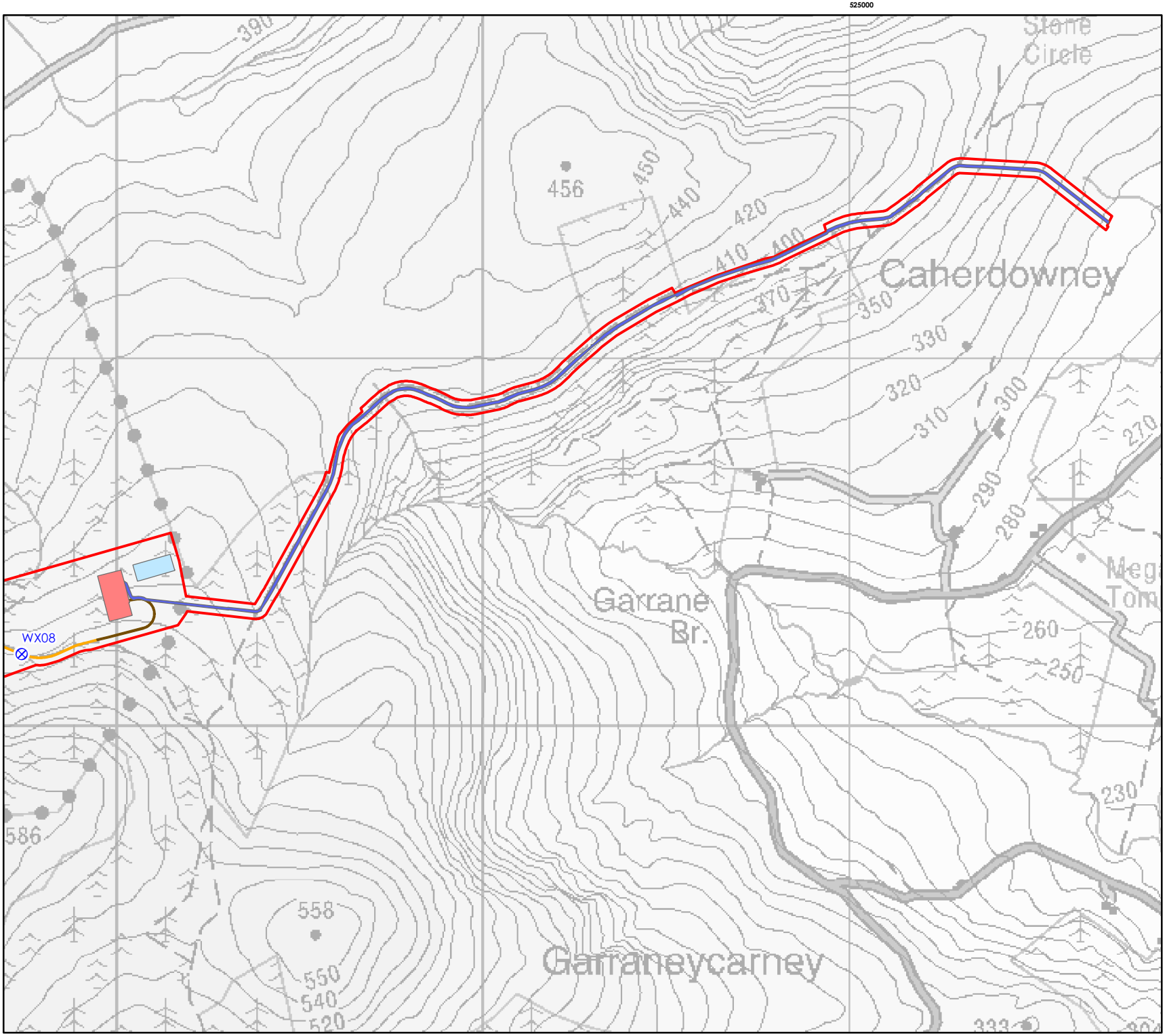

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 3e
Site Layout Plan
Connection to the Grid

Key

- Site boundary
- New watercourse crossing
- Substation
- Compound
- Cable trench
- New onsite access track - Founded
- Upgraded onsite access track

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0 125 250 500
Metres

N

Scale @ A4: 1:14,000

18/09/2024 TL01e 61253/SL/052j
Drawn by: KM Checked by: TH Approved by: MS

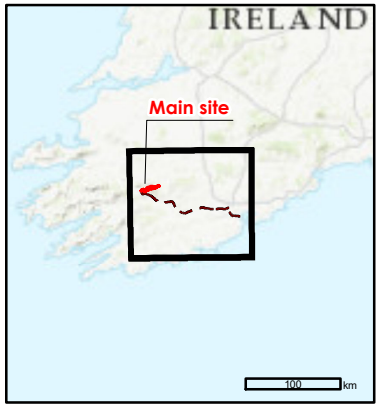
Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 4
Abnormal Loads Route

Key

- Site boundary
- Turbine Delivery Route



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0 2.5 5 10
Kilometres

N

Scale @ A4:
1:350,000

18/09/2024 61253/SL/080d

Drawn by: KM Checked by: TH Approved by: MS

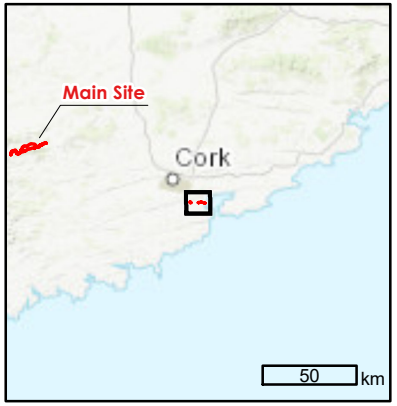
Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 5
Site Location Plan - Works Along The Turbine Delivery Route

Key

Site boundary



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0 0.25 0.5 1
Kilometres

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Drawn by: KM Checked by: TH Approved by: MS

Each wind turbine generator will have an electrical output between 6MW - 7.2MW for a total of 102MW – 122.4MW maximum inclusive.

The turbines will be built using standard concrete gravity base foundations made of poured concrete with steel reinforcement. To allow the turbines to be installed a crane hardstanding beside the turbine base will be built. No concrete batching will be undertaken on Site.

The turbines will be connected to an on-site substation using underground cabling, to be laid within the footprint of the existing and proposed access track. The underground cable connection from the on-site substation to the electricity grid network will be made from the onsite substation to the existing Ballyvouskill substation into the National Grid.

The construction of the Proposed Development is anticipated to take 24 months. Construction of the wind farm will take place in accordance with a Construction Environmental Management Plan.

The Construction Environmental Management Plan will provide the overarching environmental management principles that will be taken forward into all environmental management plans, supporting documents and method statements during the construction phase. The Construction Environmental Management Plan can be found in the EIAR as Technical Appendix 4-1.

The Proposed Development will have an operational lifespan of 35 years after which it will be decommissioned.

Decommissioning will involve dismantling the 17 turbines in reverse order to how they were erected, removing all above ground turbine components, separating them and removing them off site for recycling. Turbines will be cut on Site so as to fit on articulated trucks allowing the use of a civil construction delivery route to the south of the Site for removal.

The turbine foundations and hardstanding areas will be allowed to naturally revegetate. All other elements of the Proposed Development will remain in situ. The access tracks and associated drainage systems will serve ongoing forestry and agriculture operations in the area.

For more information regarding the description of the Proposed Development, see Chapter 4: Description of Development.

4.1 Benefits of the Proposed Development

Once operational, the Proposed Development will generate approximately between 312,732 and 375,278 MWh electricity per year to be fed into the National electricity grid.

This will displace an equivalent amount of fossil fuel generated electricity amounting to a reduction in the release of greenhouse gases equal to between 64,736 tonnes and 77,683 tonnes per year.

Through the displacement of fossil fuel fired electricity generation, the Proposed Development is expected to payback the potential carbon releases caused by the construction (and decommissioning) of the windfarm including the groundworks, building all of the infrastructure and manufacture of the turbines within 5.6 to 6.2 years of operation.

Further information on the calculation underpinning this can be found in Chapter 12: Air and Climate of the EIAR.

As a result of the electricity generated the Proposed Development could contribute up to €750,550 per annum to a Community Benefit Fund in the first 15 years of its operational life under the Renewable Electricity Support Scheme.

It is estimated that the Proposed Development will generate 261 jobs during the two-year construction period and will have wider beneficial effects, including:

- Local supply chain opportunities – wider, 'knock-on' effects of expenditure of workers visiting the area, e.g., in the accommodation, food service and retail sectors;
- Income effects – the generation of additional wages and salaries from new employment, much of which will be spent regionally or nationally; and
- Exchequer effects – additional tax revenue, regionally and nationally from increased economic activity.

For further information see Chapter 5: Population and Human Health of the EIAR.

5 Population and Health

Chapter 5 of the EIAR presents the findings of the assessment of the Proposed Development on the population and human health.

In particular the chapter assesses the likelihood of significant socio-economic effects of the Proposed Development on the surrounding area, with regards to local residents, tourism, and recreation.

The chapter takes into consideration the results of other assessments in the EIA Report which have relevance to health, namely: soils; water; air quality; noise; shadow flicker; and landscape. The findings of these assessments are reported under the associated chapter.

On this basis, the potential for negative health effects associated with the Proposed Development is negligible.

The majority of effects on population and human health receptors are likely to be experienced during the construction phase. These are likely to include beneficial effects on the local economy, including employment opportunities and increased spend on local services.

The Proposed Development does not contain a housing or services element and is not considered to have any direct, long term, positive or negative impact on the local or regional population levels.

However, construction workers who are not based locally may temporarily relocate to the region. This is more likely for the initial construction and decommissioning phase than for the operational phase. Approximately 218 jobs could be created during the construction phase.

The overall impact is considered to be negligible in terms of population and a slight positive at the local level in terms of settlement patterns where increased business is attracted to the region during the construction and decommissioning phases.

The overall impact on economic activity is predicted to be a moderate, positive, short-term impact during the construction phase of the Proposed Development.

During the operational phase, the population effects of the Proposed Development is predicted to be slight positive at the local level in terms of settlement patterns where increased business is attracted to the region.

The overall impact on economic activity is predicted to be a moderate, positive and long-term during the operational phase of the Proposed Development due to the Development Contribution Scheme, annual rate payments and the Community Benefit Package.

The operational phase effects of the Proposed Development have been assessed to be negligible and not significant for the tourism economy and will not significantly impact on property values in the area.

The Proposed Development could also have an effect on socioeconomic, tourism and recreation during the decommissioning phase. Due to the relatively young age of the industry, there is a lack of data around the potential economic impact of the decommissioning phase.

When full decommissioning takes place, the effects are likely to be short term and similar in nature but lesser than construction phase effects.

6 Landscape and Visual Impact Assessment

Chapter 6 of the EIAR presents the findings of a Landscape and Visual Impact Assessment of the Proposed Development.

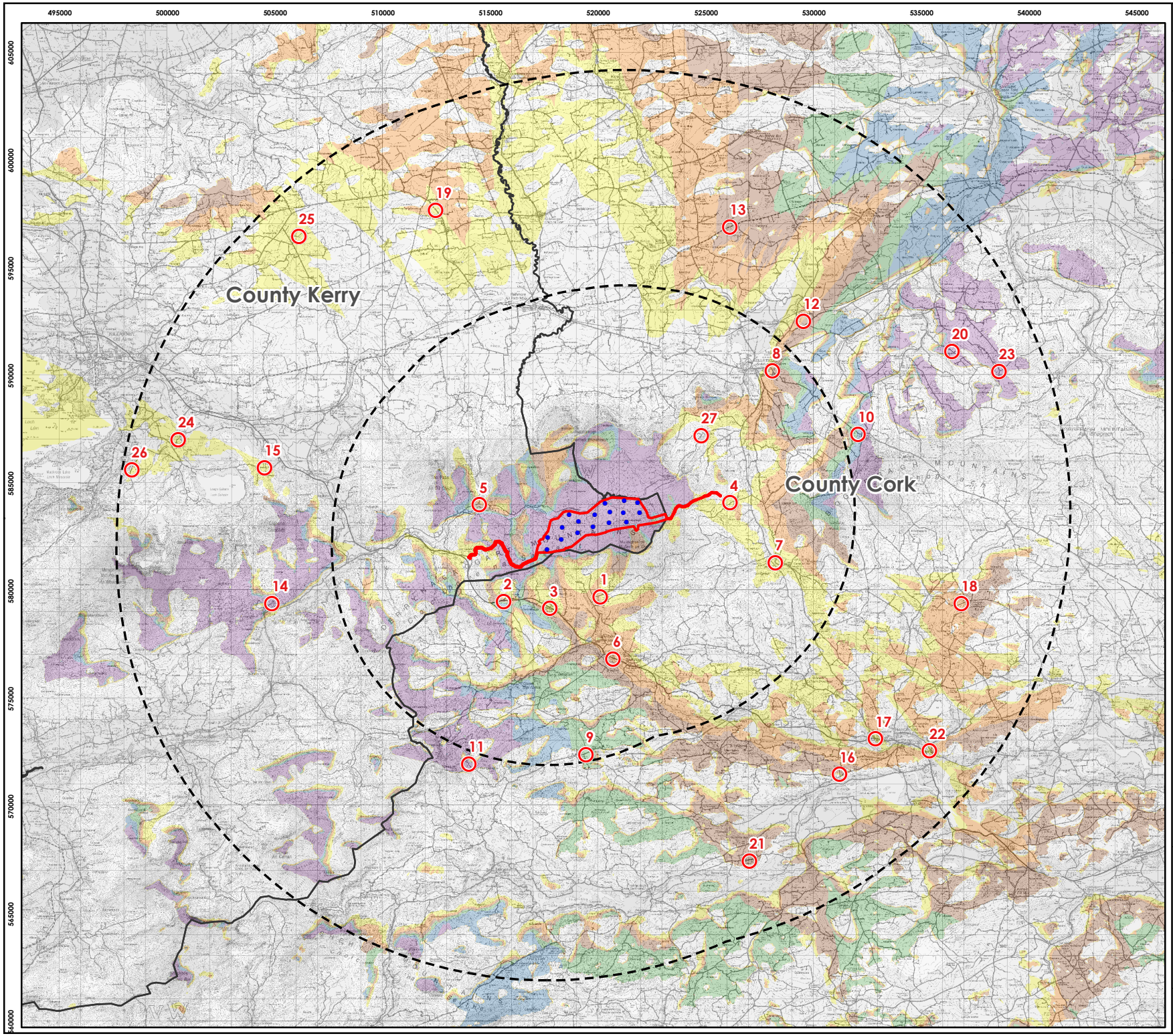
The Proposed Development Site is located within the Kerry County Council Landscape Character Type 27: Clydagh River, The Paps and Derrynasaggart Mountains and Cork County Council Landscape Character Type 15b: Ridged and Peaked Upland, which are identified as medium sensitivity to the type of development proposed.

The site is also located within an area designated by Kerry County Council as a Visually Sensitive Area (see Figure NTS 3 above).

In order to focus the assessment on landscape and visual receptors that were considered to have potential experience significant effects, a detailed study area was defined. This included people and protected landscapes located within 20km of the proposed turbines.

The assessment considered effects on landscape character and designations, visual effects on settlements and roads and scenic routes as well as views and visual amenity as experienced from 27 representative viewpoints.

These viewpoints were selected and agreed with Kerry County Council on the basis of theoretical visibility and are shown on Figure NTS 6 below.



Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 6
Zone of Theoretical Visibility
200m Blade Tip Height to 20km

Key

- County boundary
- Site boundary
- Proposed turbine
- Landscape Viewpoint
- 10km turbine buffers to 20km

Zone of Theoretical Visibility

200m blade tip height

- 1 - 3 turbines visible
- 4 - 6 turbines visible
- 7 - 9 turbines visible
- 10 - 12 turbines visible
- 13 - 15 turbines visible
- 16 - 17 turbines visible

Generated using Copernicus Land Monitoring Service EU-DEM Dataset which does not take into account the screening effects of buildings or vegetation.

ZTV calculated using ArcGIS 10.6 Viewshed tool with observer eye height 2m above ground and corrections for earth curvature and atmospheric refraction applied.

Coordinate system: IRENET95 ITM

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0 2.5 5 10

Kilometres

N

Scale @ A4: 1:235,000

18/09/2024 DI2.2 61253/ZV/096b

Drawn by: KM Checked by: TH Approved by: MS

Receptors beyond this study area were considered unlikely to experience significant effects due to limited predicted visibility of the proposed turbines. Where visibility was predicted it was considered that the Proposed Development was unlikely to be prominent within views.

A precautionary approach has been adopted in the assessments whereby all and on views from the construction and operation of the Proposed Development to be adverse.

The Proposed Development will introduce further turbines within the landscape, though the proposed turbines will largely be viewed from the same locations where operational turbines already form a component of existing views, ensuring limited occasions where the Proposed Development will introduce a new feature into a view.

Whilst the Proposed Development will result in significant localised effects upon the Visually Sensitive Area and the landscape within the Site, the surrounding context, vast scale and undulating nature of the receiving landscape is such that the landscape could accommodate the Proposed Development without leading to unacceptable effects on the overall landscape setting or visual amenity.

When considering the effects of the Proposed Development cumulatively with other windfarms, the Proposed Development will be seen in the context of the windfarms at Knocknamork, Clydaghroe, Gneeves, Coomacheo, Caherdowney and Curragh.

The resulting cumulative interactions include stacking of turbines and a prominent collection of turbines in distant views. The cumulative effects of these interactions at a distance are, however, not substantial due to the distance at which these interactions will be experienced.

7 Traffic and Transport

Chapter 7 of the EIAR assesses the potential environmental effects associated with increased traffic generated by the Proposed Development.

The route for general construction HGV traffic travelling to the site is via the N22 and N40 from Cork. The turbine components would be transported by abnormal load vehicles from Ringaskiddy Port via the N28, N40 and N22 to Site (as per figure NTS 4 above).

The use of this route will involve some minor temporary modifications to parts of the road network as follows:

- Removal of flower pits and fencing to allow access from Ringaskiddy Port onto the N28;
- Removal of street furniture at the roundabout at the junction of the N28 and the Pfizer Industrial Estate in Ballintaggart;
- Removal of street furniture at the roundabout at the junction of the N28 and Marian Terrace at Shanbally Cross;
- Removal of street furniture at the splitter island on the entrance to the Shannonpark roundabout between the N28 and R611 north of Carrigaline.

All general construction traffic will access the site via the existing Coillte CGA site entrance, directly from the N22 at Cummeenavrick which is approximately 7.4km north of Ballyvourney.

A new site entrance will be formed at the junction of the site access road and the N22.

The traffic generated by the construction of the Proposed Development (over a 24-month period) will result in a temporary increase traffic levels of up to a maximum of 2,107 additional two-way HGV movements over the first three months of the construction period.

Approximately 30 construction staff would be present on site on an average day resulting in a movement of 60 two-way car /LGV movements per day.

This corresponds with an approximate increase in HGV movements of between 5% and 18% on the N22 north and south of the site and between 3.5% and 6.5% between Junctions 1 and 2 on the N40 Cork Ring Road the N28 at Raffeen Bridge, Ringaskiddy.

The increase in car/LGV traffic would be negligible (less than 5%).

An average of 7.5 abnormal load movements would take place between months 18-22 of the 24-month construction period.

Given the low number of vehicles, the short duration for which abnormal load vehicles will be on the local road network and the limited temporary nature of the modifications required to allow the movement of those loads; it is not anticipated that the movement of abnormal load vehicles will give rise to any significant environmental effects.

Knocknamork Windfarm is located to the south of the Proposed Development site and shares the same site access. As the Applicant has control of the site entrance and the access road the construction of the windfarms will be programmed to ensure the peak construction periods do not overlap.

When the Proposed Development is operational, only a small number of vehicles will access the Proposed Development on an infrequent basis to undertake inspections or maintenance activities. Traffic associated with the future decommissioning stage is anticipated to be significantly less than that generated during construction.

The environmental effects of increased traffic as a result of the Proposed Development have been determined to be Not Significant with the road network able to accommodate the additional traffic arising in the busiest months of construction.

8 Biodiversity

Chapter 8 of the EIAR considers the potential significant effects of the Proposed Development on biodiversity in terms of terrestrial and aquatic ecology.

Desk and field surveys were undertaken within and adjacent to the Proposed Development to of ecological features, including habitats, mammals, bats, fish, terrestrial and aquatic invertebrates.

As a result the following important ecological features were identified:

- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation (SAC), located adjacent to the northern boundary of the Proposed Development Site
- Wet Heath habitat, present on site in fragmented and isolated remnants;
- Kerry slug;
- Leisler's bat
- Myotis bat species;
- Common pipistrelle;
- Atlantic salmon;
- Trout; and
- Lamprey species.

For other SAC habitats and species, effects are less likely due to a lack of connectivity between the population within the Site and the SAC. There is unlikely to be interchange between Kerry slug populations in the Site and the SAC as the river gorges will prevent physical access.

The main potential impacts of the Proposed Development on ecology are:

- Direct habitat loss or damage (permanent and temporary);
- Indirect habitat loss from drying out effects caused by works in the vicinity;
- Sedimentation or other pollution of watercourses from construction activities and vehicular traffic;
- Secondary effects on sensitive habitats through siltation/pollution/spread of invasive species;
- Inadvertent killing, injuring or disturbance of fauna during construction; and
- Bat collision with turbines or barotrauma during operation.

There is potential for short, minor, temporary, indirect effects on water quality on the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment watercourses and the species they support which. These are not considered to be significant.

The Proposed Development will result in the direct loss of 0.9ha of wet heath. This loss of wet heath will be compensated by the replacement of 4.76ha in areas around turbines 11 and 17. This will be achieved through a programme of ditch blocking to raise the water level and the installation of cut off drains to isolate these areas from runoff and nutrient enrichment sources.

No significant effects are likely for Kerry slug within the Proposed Development as a translocation, under licence from the National Parks and Wildlife Service, will be

undertaken to clear working areas prior to construction. As forestry operations, unrelated to the Proposed Development, have been in place for many years, Kerry slug is considered able to thrive in this changing environment.

Kerry slug habitat will be improved through undertaking a rhododendron eradication programme (rhododendron invasion being one of the main threats to the species), retaining felled tree stumps and surface boulders and the installation of roadside underpasses.

Comparatively high activity of Leisler's bat (*Nyctalus leisleri*) and common pipistrelle (*Pipistrellus pipistrellus*) was recorded at some locations within the Proposed Development Site. This is a species considered vulnerable to collisions from operational turbines at both an individual and population level.

To mitigate this a programme of curtailment will operate involving changing the operational parameters of specific turbines to cut in at higher windspeeds at higher temperatures at certain times of the year as follows:

- Summer (June – mid-August and Autumn (mid-August – mid September); turbines 7 and 10;
- Autumn; turbine 8; and
- Autumn; turbine 2.

Atlantic Salmon *Salmo salar* was found on the River Clydagh and associated tributaries. Trout *Salmo trutta* was also found on these watercourses and the Mullaghanish River. However, no significant effect is likely given the mitigation measures which will be in place to prevent pollution (See Section 11 below). These include:

- Avoidance of sensitive aquatic areas by using a buffer zone between construction activities and the watercourses where possible;
- Installation of double silt fences between watercourses and any work within the buffer zones (e.g. approaches to watercourse crossings);
- Undertaking watercourse crossing work within the months of July to September only to avoid impacts on spawning salmonids and lamprey;
- Discharging surface water runoff by diffuse overland flow or through the use of settlement ponds; and
- Preventing any discharge of water contaminated with cement, hydrocarbons or other pollutants.

Fish habitat will be improved through improving bankside conditions by planting willow species on eroded bankside and selective thinning of woodland where mature trees are resulting in overshading. Existing obstacle to fish passage will also be removed.

Control of construction activities to avoid impacts on habitats and species will be managed through the Construction Environment Management Plan, and overseen by an Ecological Clerk of Works.

In addition to the above, existing grassland will be improved to encourage colonisation by marsh fritillary butterfly (one of the qualifying interests of the nearby SACs).

9 Ornithology

EIAR Chapter 9 assesses the potential impact of the Proposed Development on birds.

Vantage point surveys were undertaken between March 2021 and October 2023 to determine which birds were present and to characterise their behaviour in terms of their risk of collision with the turbine blades.

In addition, the following surveys were carried out:

- Hen harrier roost survey over three winters: 2018-2019, 2019-2020 and 2020-2021;
- Breeding raptor surveys in 2019 and 2020;
- Breeding bird surveys also in 2019 and 2020;
- Wintering bird surveys over the winters of 2028-2019 and 2019-2020;
- Breeding Red grouse surveys in March 2019 and March 2020; and
- Breeding Woodcock surveys in March and June 2019.

The surveys determined limited hen harrier activity with only six flights observed during surveys, all within the non-breeding period.

No observations were made of Greenland White-fronted geese (a qualifying species of the Killarney National Park Special Protection Area located c.19km from the site).

Other sensitive species recorded included non-breeding Golden plover, breeding Woodcock and Red grouse.

The main potential impacts of the construction, and operational phases of the development on ornithology are:

- Direct and/or indirect habitat loss during the construction stage.
- Disturbance and displacement as a result of human activity.
- Disturbance/displacement including barrier effects (where the operational windfarm creates an obstacle to movement of birds, particularly when migrating); and
- Additional mortality as a result of turbine collisions.

The limited available habitat for breeding Red grouse means that impacts during construction would be limited. There is a potential for a minor beneficial effect through the clearance of forestry which would create additional areas of suitable habitat.

Woodcock breed in forest, so the clearance of forestry for the construction of the Proposed Development would represent a loss of habitat. However, Woodcock make use of open areas within forests for foraging and nesting so a more diverse structure to the forest could be beneficial.

The fact that the Site is already subject to regular felling as part of the commercial forestry operations means that the birds could be used to some degree of disturbance.

Ultimately little is known about the ecology of this species, so as a minor negative effect is assumed due to loss of habitat as a conservative measure.

Impacts on birds during construction would be mitigated by avoiding vegetation clearance during the breeding season (March to August) where possible. Nest protection areas would be established where nests are identified during ongoing monitoring and putting in place a disturbance buffer for Hen harrier should any

breedingoccur. The construction works and ongoing monitoring would be overseen by the Ecological Clerk of Works.

Whilst both Hen harrier and Golden plover are considered to be at risk of collision with the turbines; modelling the risk showed that the risk was equivalent to 0.001 collisions per year for non-breeding Hen harrier (i.e. less than one collision over the lifespan of the windfarm) and 2.197 for non-breeding Golden plover.

Given that flocks of up to 175 Golden plover were identified at any one time during the surveys, this collision rate is not sufficient to have an impact on the population. The fact that Golden plover are not present in the core of the Site, indicates that they are not at risk of being displaced by the Proposed Development.

No collisions were predicted for breeding birds of either species. No other bird species were observed as being at collision height.

No significant effects are predicted on birds either in isolation or cumulatively with other projects.

10 Soils, Geology and Hydrogeology

Chapter 10 of the EIAR provides an assessment of the potential effects of the Proposed Development on soils, geology and hydrogeology.

This assessment included a desk based review and site investigations including site walkovers, peat probing to determine peat depth across the site and a geotechnical investigation including trial pits, core sampling and testing for phosphate levels in the soils.

The Proposed Development Site consists largely of sandstone overlain by blanket peat. The majority of the Site overlies the Cahersiveen Groundwater Body with the grid route overlying the Ballinghassig West Groundwaer Bodies. Both the Cahersiveen and the Ballinghassig West Groundwater Bodies have "Good" environmental status and neither are not considered "At Risk" under the Water Framework Directive[3].

There are no groundwater abstractions with potential hydrogeological connectivity to the Site.

Peat is present across large parts of the Site, generally between 1-2m deep but with localized deeper pockets. A peat landslide hazard risk assessment has been undertaken and found that landslide risk to be low but with areas where construction traffic and material stockpiling will need to be prohibited to avoid creating a risk.

There are no likely historical sources of significant contamination within the site, other than the possible use of phosphate fertilisers associated with the forestry use.

The Proposed Development have the potential to give rise to significant effects in terms of:

- Peat loss associated with excavations for the windfarm infrastructure;
- Peat compaction as a result of construction traffic;
- Increased erosion due to tree felling and loss of vegetation;
- Increased landslide risk as a result of construction activities;
- Potential pollution of groundwater; and
- Alteration and increased vulnerability of localised groundwater regime due to excavations and installation of windfarm infrastructure.

Reducing the potential impacts has been considered throughout the design process particularly in terms of the siting of infrastructure. Mitigation measures to avoid impacts consist of the application and monitoring of control measures detailed in the Construction Environment Management Plan during the construction period. In particular:

- The application of safety buffers around areas peat stability risk areas;
- Construction of borrow pits and peat repositories in accordance with the measures detailed in the Construction Environment Management Plan and the Peat Management Plan (Technical Appendix 10-3)

[3] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

- Backfilling excavations as quickly as possible and avoiding work in severe weather to minimize the risk of erosion;
- Keeping all construction plant within a delineated work corridor to limit the extent of any damage to soils;
- Proper control of waste, and potentially polluting liquids in accordance with the measures specified in the Construction Environment Management Plan; and
- Ongoing monitoring of the installed windfarm infrastructure for stability and erosion risk through construction and operation of the Proposed Development of peat store and slopes

No significant residual effects (including cumulative) effects are considered likely following the implementation of the specific mitigation measures detailed in Chapter 10 and the documents listed above.

11 Hydrology, Water Quality and Flood Risk

Chapter 11 of the EIAR presents the findings of the assessment of the impact of the Proposed Development on the surface water environment including on hydrology (movement of surface water), water quality, the potential for pollution of watercourses, and risk of flooding.

The assessment of potential effects undertaken involved a combination of desktop investigations and field surveys. Where constraints were identified during the assessment, they were reported to the design team at the early stage of design development and avoided as far as possible within the proposed layout.

The Proposed Development Site is located in the upper sections of the River Clydagh catchment (a tributary of the River Flesk) which drains into Lough Leane approximately 28 km downstream and to the west of the Proposed Development site.

The River Clydagh is fed by several smaller watercourses draining the Proposed Development site. The significance of the River Clydagh and wider River Flesk catchment to protected species and habitats associated with the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC has been considered as part of this assessment.

The sensitivity of Lough Leane with regards to potential nutrient pollution has also been considered within the assessment.

None of the Proposed Development infrastructure is located in areas identified as being at risk of flooding with the exception of watercourse crossings and their approaches. The crossings will be designed to ensure flood resilience.

Aspects of the design, construction, operation, and decommissioning of the Proposed Development that may impact on the receiving water environment have been identified and the pathways of potential effects assessed. Mitigation measures to minimise potential adverse effects, include:

- Design of site elements to minimise potential adverse effects on the water environment (e.g., careful consideration of the positioning of wind turbines, foundations, and areas of hard standing e.g., access tracks);
- Avoidance of significant water features (i.e., establishing zones around watercourses where construction works are to be avoided);
- Careful management of water features where they meet new infrastructure or upgraded access tracks, ensuring that the watercourse beds are unaffected where there is potential fishery habitat where a track crossing is required by using a clear span rather than culvert (pipe) structure;
- Implementation of a comprehensive water quality monitoring and response plan to monitor the effects on surface water quality during construction phase (including tree felling) to ensure that good water quality is maintained, and habitats such as fish and other aquatic species that could be affected by pollution are not affected;
- Implementation of a comprehensive surface water management plan comprising the use of Sustainable Drainage Systems and silt management to prevent pathways for pollution reaching the wider environment as well as reducing any increased risk of flash flooding downstream; and

- Establishing pollution prevention procedures to minimise the potential risk to the wider environment posed by construction, operation, and decommissioning-phase activities (e.g., accidental spillage of oils or chemicals).

Following Implementation of the above mitigation the Proposed Development would have no significant residual effects to the receiving water environment including the River Clydagh, River Flesk, Lough Leane and designated Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC.

Monitoring the effect of the Proposed Development on the water environment including designated SAC and responding with any necessary additional mitigation measures (e.g., stopping felling or construction works), is be provided through a comprehensive water quality monitoring and response plan provided in the Construction Environment Management Plan.

This will commence prior to the start of construction and continue through all phases until 12 months following commencement of operation.

The effects of the Proposed Development on the water environment were also considered should existing environmental conditions change during the lifetime of the development, for example, due to the predicted effects of climate change. It was concluded there are no likely significant effects on the water environment arising from the Proposed Development in the event of predicted environmental changes.

An assessment of cumulative impacts was also undertaken, and it was concluded that there are no predicted significant effects on the water environment arising from the Proposed Development in conjunction with any other pre-existing or consented developments.

12 Air and Climate

Chapter 12 of the EIAR assesses the effects of the Proposed Development on air quality, climate change and carbon balance.

The carbon balance was estimated by comparing the carbon emissions from the construction and decommissioning of the Proposed Development against the avoided emissions through the replacement of fossil fuel electricity generation by the electricity generated through the windfarm operation.

Two scenarios were assessed for the purposes of determining the carbon calculations:

- Scenario 1 models the generation capacity at 6MW per turbine; and
- Scenario 2 models the generation capacity at 7.2MW per turbine.

Scenario 1 has a carbon payback time of 6.2 years for an estimated 401,938 tonnes of CO_2 equivalent when compared against a common grid energy mix.

Scenario 2 has a carbon payback (equalisation) time of 5.6 years for an estimated 434,259 tonnes of CO_2 equivalent when compares against a common grid energy mix.

This is a long-term positive effect and is consistent with the objectives of the Irish Government's Climate Action Plan 2023, reflecting a move away from fossil fuels in favour of renewable electricity generation.

The Proposed Development does not have the potential to affect National or regional air quality, however, there is the potential for significant effects as a result of dust arising due to construction activities.

Accordingly, a detailed dust assessment was completed which identified a medium risk of impact on the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, in particular the Killarney Fern which is sensitive to dust soiling.

Any potential effects would, however, be localised to the area around construction of infrastructure near the northern boundary of the site where it borders the SAC. Once mitigation is applied in the form of good practice measures (using construction methods that minimise dust release, use of appropriate dust suppression techniques and careful material handling, no significant effects are anticipated.

Due to the localised, temporary nature of potential air quality effects no cumulative effects are anticipated.

13 Noise

Chapter 13 of the EIAR considers the potential significant effects of noise caused by the Proposed Development.

Noise sources associated with the Proposed Development are the operation of plant and machinery during construction and decommissioning and the noise created by the movement of the turbine blades during operation.

Creation of the borrow pits may require blasting, however, this would be of short duration with effects minimised through good blast design and proper notification to nearby residents of blasting activity.

Due to the temporary nature of construction works, and the typically large distances between turbines and neighbouring properties, and the fact that noise levels associated with the construction of wind turbines are relatively low, no significant effects are anticipated due to the construction and of the turbines including the excavation and installation of the turbine bases.

Noise from heavy goods vehicles and site traffic movements along local roads will intermittently cause increases in noise levels, particularly for dwellings located along the proposed routes to the Proposed Development.

There is potential for a breach in the prescribed noise limits at one property during the construction of the access track, However, this breach assumes that all of the construction plant would be operating simultaneously at the same location and would only occur over the course of a single working day whilst the track in the vicinity of the property is being constructed and.

Any planned deliveries or construction works during night-time and/or other sensitive hours do have the potential to wake or disturb the residents of neighbouring dwellings.

However, any such events, if unavoidable, will be agreed with the local authority and residents will be kept informed of these activities prior to these activities taking place. Furthermore, measures to mitigate noise levels as far as is feasibly practicable will be used to reduce any potential impacts as far as possible.

An assessment of the overall increase in road traffic noise has shown that the impact on nearby dwellings will be negligible as the increase in vehicles is small in comparison with existing traffic flows.

As a result, no significant noise effects are predicted as a result of the construction (or decommissioning) of the Proposed Development and there are no other known construction projects in the area which would add cumulatively to noise levels at the properties in the vicinity of the Proposed Development during construction.

To inform the assessment of the noise impact as a result of the operation of the Proposed Development, baseline noise measurements were carried out at four locations neighbouring to supplement the baseline noise measurements previously undertaken in relation to neighbouring wind farm projects.

Noise Predictions were made for the four candidate turbines, with one (the Nordex N163 5.6MW model) found to have the highest potential noise impacts at all receptors and so was selected for detailed analysis.

The resulting assessment shows that predicted turbine noise levels meet the applicable noise limits at all but two properties, one during the day and one during the night.

Accordingly, a curtailment strategy for daytime operation is needed for turbines 9 to 15 and turbines 6 to 15 during nighttime operation. This curtailment involves operating the turbines in a reduced noise mode at higher windspeed or shutting the turbine down if the turbine model does not have a reduced noise operating mode.

Taking this into account no significant noise effects are anticipated during operation.

The noise limits against which the operation noise is assessed have been derived taking into account the operational noise from other windfarms. This means that the cumulative operational noise impact assessment is inherent in the assessment. Accordingly, no significant cumulative noise impacts are anticipated.

14 Cultural and Archaeological Heritage

Chapter 14 of the EIAR assesses the potential effects of the Proposed Development on the archaeological, architectural and cultural heritage landscape both on and surrounding the Proposed Development Site. The assessment is based on both a desktop review of the available cultural heritage and archaeological data and a comprehensive programme of field walking.

The assessment comprises a determination of direct impacts on sites of heritage importance as a result of physical disturbance and indirect impacts where the Proposed Development impacts on the setting of the heritage asset within the existing landscape. A study area was therefore identified based on the Proposed Development Site itself and the theoretical visibility of the Site outside the Site boundary.

The desktop review identified that The Paps Archaeological Landscape[4] bounds the Proposed Development Site to the northeast and that there are no National Monuments within the study area.

There are 143 recorded archaeological monuments within 5km of the Proposed Development Site, however, only one is located within the Site itself (a hut site) and that is located within mature forestry. No discernible remains of this site could be identified during the site visit. The location of this site is away from the windfarm infrastructure.

These are shown on figure NTS 7a to 7e below.

There are five undesignated sites within the Site boundary, three of which could be affected by the Proposed Development.

There are also seven areas of archaeological potential within the Site boundary. These areas have a higher potential for unknown archaeological features to be present.

Accordingly a systematic advance programme of geophysical surveys and archaeological trenching (where practical) along the cable route and the turbine route together with monitoring by a suitably qualified and Licenced archaeologist will be undertaken prior to construction in those areas.

This will allow identification of any undesignated or previously unidentified archaeological features during groundworks allowing their preservation in situ or by record (excavation).

No significant effects (direct or indirect) are anticipated in relation to the construction of the Proposed Development.

Operational effects constitute indirect effects and given that no surface trace of the single Recorded Monument on the Proposed Development Site survive, there can be no effects on the immediate setting of this monument.

Given that many of the designated cultural heritage sites in the wider landscape are already obscured from view by the natural landscape, the visual impact of the Proposed Development is lessened to some degree.

[4] See County Kerry Development Plan (2022-2028)

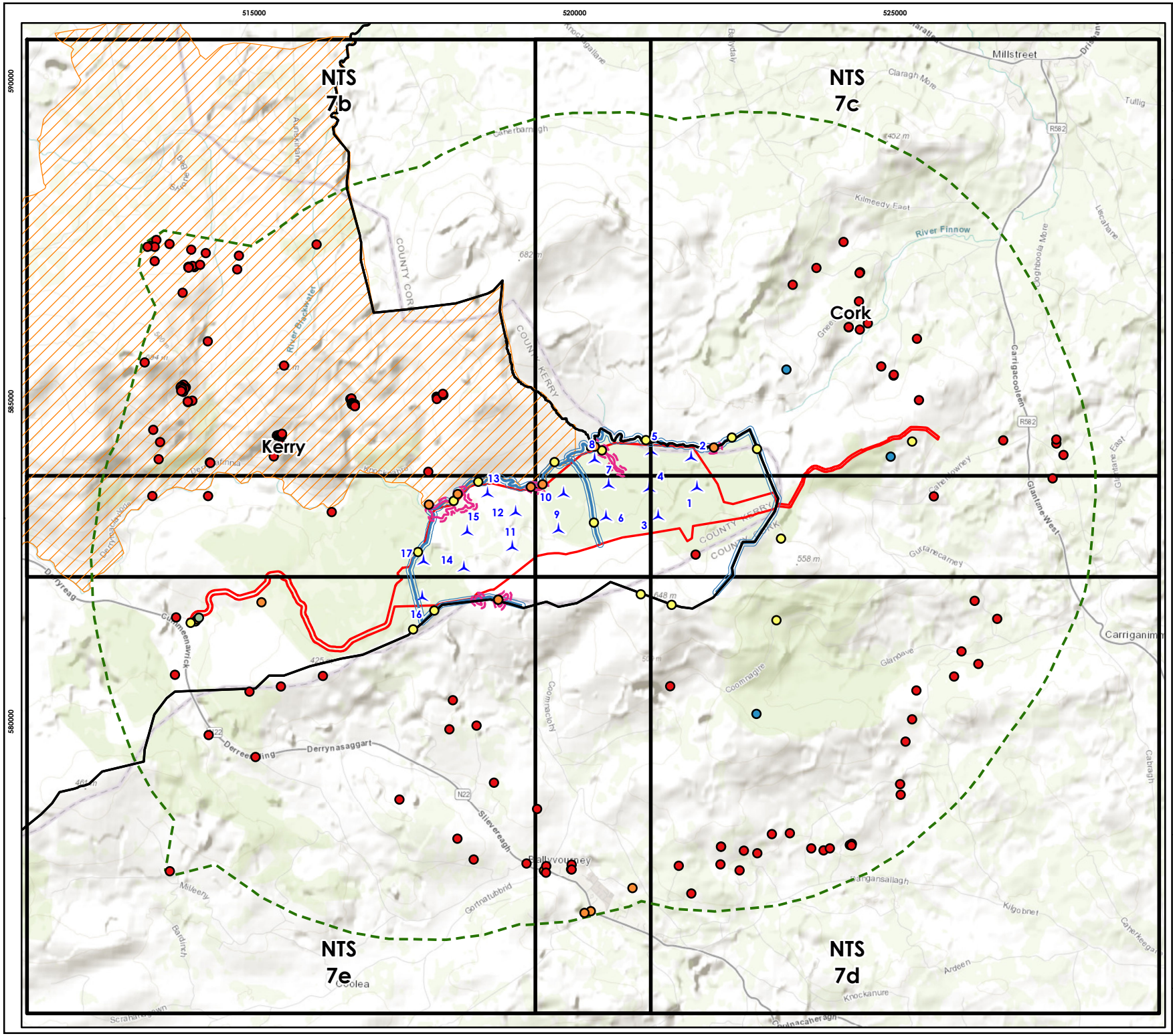
It is also considered that this visual impact is reversible. However, overall impact on designated cultural heritage sites within 5km is considered to be Moderate, largely owing to the proximity of The Paps Archaeological Landscape and the impact to setting of this landscape as it is viewed to and from the east and southeast.

When considering the impact of the Proposed Development cumulatively with other windfarms in the area it is considered that the cumulative effects of the Proposed Development with the Curragh/Coomacheo and Knocknamork Windfarms will have a likely long term negative slight indirect effect on the cultural environment.

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 7a
Overview of Cultural Heritage Sites within Study Area
Overview



Key

- Site boundary
- Study Area (5km)
- County Boundary
- Proposed Turbine Location

Cultural Heritage Sites (Baseline value)

- Very High
- High
- Medium/High
- Medium/Low
- Low
- Archaeological Area 13
- Cultural Heritage Sites (first edition)
- 50m buffer from Cultural Heritage Sites (first edition)
- Townland boundary (within development)
- 50m buffer from Townland boundary (within development)

atmos CONSULTING

0 0.75 1.5 3

Kilometres

N

Scale @ A4: 1:79,000

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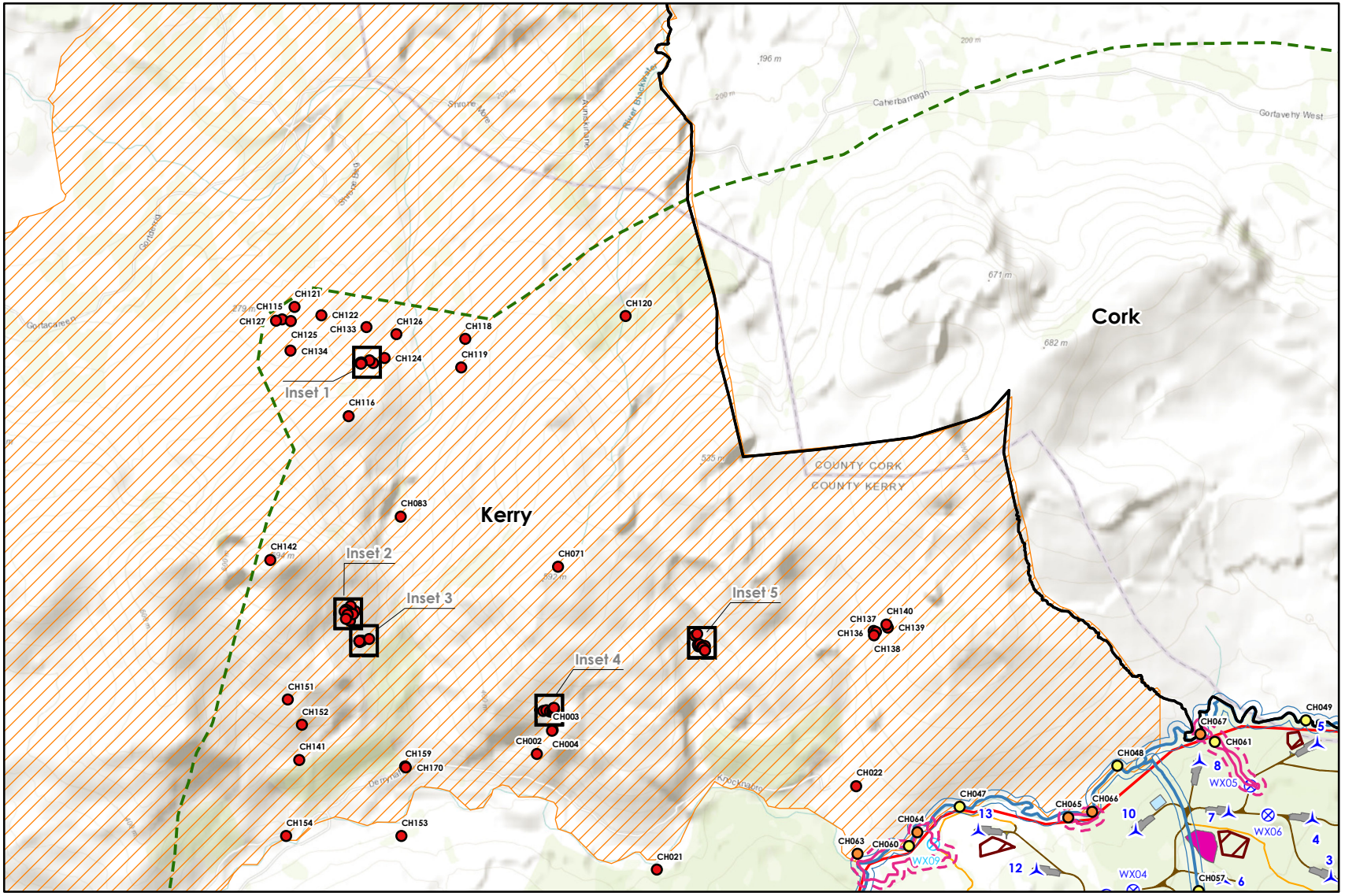
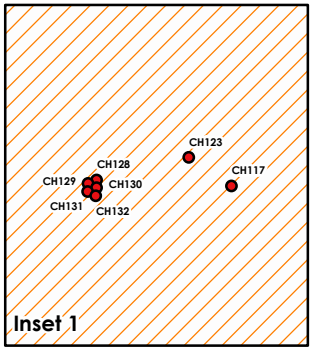
Drawn by: KM	Checked by: TH	Approved by: MS

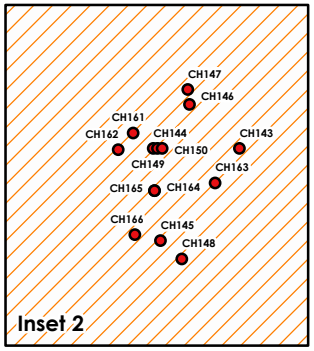
Cummeennabuddoge Wind Farm

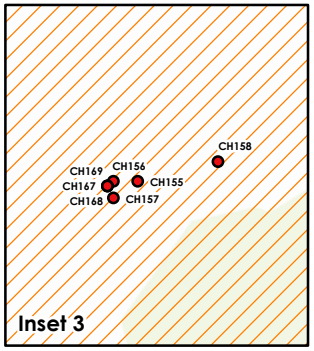
Cummeennabuddoge Wind Farm

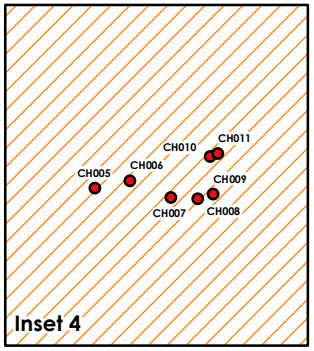
Figure NTS 7b
Overview of Cultural Heritage Sites within Study Area
North Western Extent

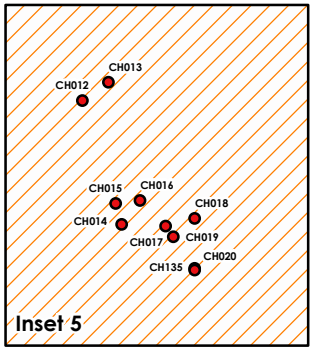












Key

- Site boundary
- Study Area (5km)
- County Boundary
- Proposed Turbine Location
- New watercourse crossing
- Existing watercourse crossing
- Foundations and hardstandings
- Compound
- Borrow pit
- Peat repository
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

Cultural Heritage Sites (Baseline value)

- Very High
- High
- Medium/High
- Archaeological Area 13
- Cultural Heritage Sites (first edition)
- 50m buffer from Cultural Heritage Sites (first edition)
- Townland boundary (within development)
- 50m buffer from Townland boundary (within development)

atmos CONSULTING

0 0.5 1 2
Kilometres

N

Scale @ A4:
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Insets: 1:5,000

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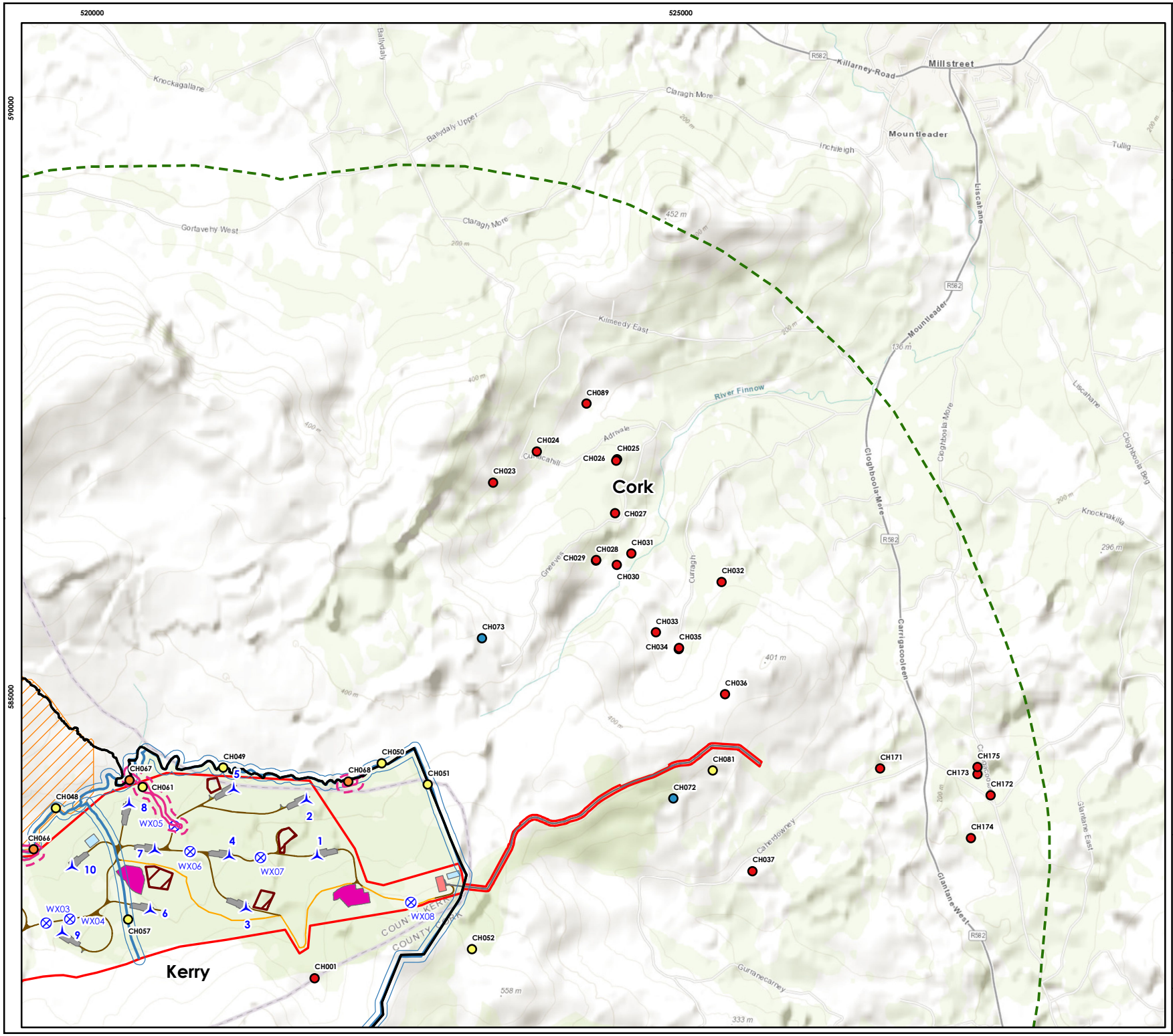

Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 7c
Overview of Cultural Heritage Sites within Study Area
North Eastern Extent

Key

- Site boundary
- Study Area (5km)
- County Boundary
- Proposed Turbine Location
- New watercourse crossing
- Foundations and hardstandings
- Substation
- Compound
- Borrow pit
- Peat repository
- Cable trench
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

Cultural Heritage Sites (Baseline value)

- Very High
- High
- Medium/High
- Low
- Archaeological Area 13
- Cultural Heritage Sites (first edition)
- 50m buffer from Cultural Heritage Sites (first edition)
- Townland boundary (within development)
- 50m buffer from Townland boundary (within development)

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Kilometres

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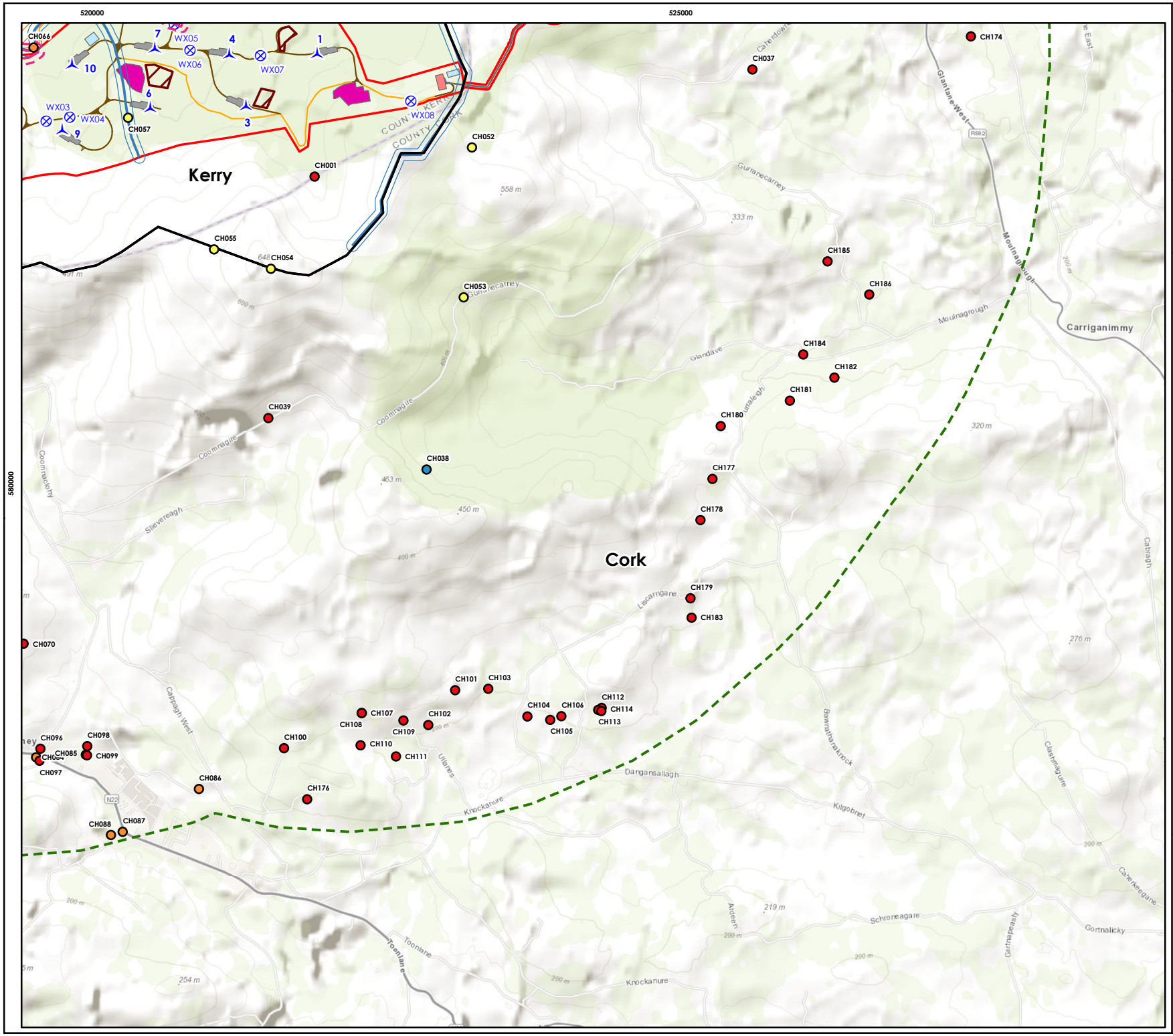
Scale @ A4: 1:43,000

18/09/2024 TL01e 61253/SL/093c

Drawn by: KM Checked by: TH Approved by: MS



Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 7d
Overview of Cultural Heritage Sites within Study Area
South Eastern Extent

Key

- Site boundary
- Study Area (5km)
- County Boundary
- Proposed Turbine Location
- New watercourse crossing
- Foundations and hardstandings
- Substation
- Compound
- Borrow pit
- Peat repository
- Cable trench
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

Cultural Heritage Sites (Baseline value)

- Very High
- High
- Medium/High
- Low
- Archaeological Area 13
- Cultural Heritage Sites (first edition)
- 50m buffer from Cultural Heritage Sites (first edition)
- Townland boundary (within development)
- 50m buffer from Townland boundary (within development)

atmos CONSULTING

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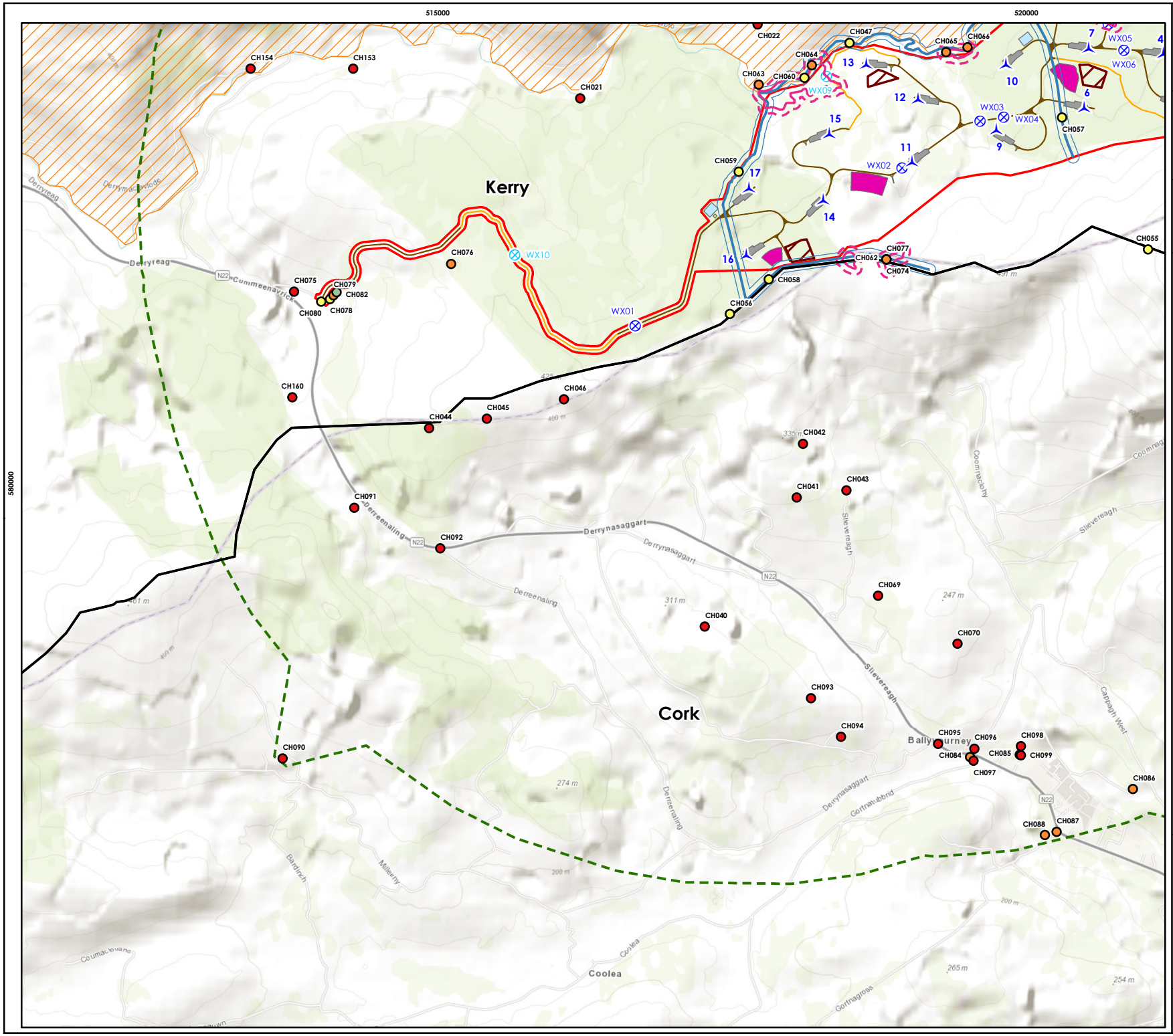
Kilometres

N

Scale @ A4: 1:43,000

18/09/2024	TL01e	61253/SL/093c
Drawn by: KM	Checked by: TH	Approved by: MS



Cummeennabuddoge Wind Farm

Cummeennabuddoge Wind Farm

Figure NTS 7e
Overview of Cultural Heritage Sites within Study Area
South Western Extent

Key

- Site boundary
- Study Area (5km)
- County Boundary
- Proposed Turbine Location
- New watercourse crossing
- Existing watercourse crossing
- Foundations and hardstandings
- Compound
- Met mast hardstanding
- Borrow pit
- Peat repository
- New onsite access track - Founded
- Upgraded onsite access track
- New turning head

Cultural Heritage Sites (Baseline value)

- Very High
- High
- Medium/High
- Medium/Low
- Archaeological Area 13
- Cultural Heritage Sites (first edition)
- 50m buffer from Cultural Heritage Sites (first edition)
- Townland boundary (within development)
- 50m buffer from Townland boundary (within development)

atmos CONSULTING

0 0.5 1 2
Kilometres

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Scale @ A4:
1:43,000

18/09/2024	TL01e	61253/SL/093c
Drawn by: KM	Checked by: TH	Approved by: MS

15 Shadow Flicker

Chapter 15 of the EIAR considers the potential effects of shadow flicker as a result of the Proposed Development.

Shadow flicker can arise from the passing of the moving shadow of an operational wind turbine rotor-blade over a narrow opening such as the window of a nearby residence. A similar effect can also occur when the gloss blades of a rotating turbine reflect the sun causing a flashing light.

Shadow flicker happens only when a certain combination of conditions coincide at particular times of the day and year, mainly in the winter months when the sun is low in the sky.

The occurrence of shadow flicker and the extent of its effects are dependent on a number of factors, namely:

- Distance from the wind turbine;
- Turbine hub height and rotor diameter;
- Speed of blade rotation;
- The proportion of sunny weather during the months when flicker can occur; and
- The size, shape and orientation of any windows or doors of neighbouring properties.

The flickering may have the potential to cause disturbance and annoyance to residents. It is, however, not possible for shadow flicker to cause photosensitive epilepsy.

Shadow flicker is most likely to be experienced within 10 rotor diameters, so a study area was derived taking into account the full range of dimensions in relation to the turbine models proposed.

Within this study area, four dwellings were identified with two of those discounted due to their position to the south of the Proposed Development Site. It is not possible for these dwellings to experience shadow flicker as there is no time in the year that the Proposed Development would lie between them and the sun.

Following the calculation of shadow flicker for the Proposed Development, daily and annual shadow flicker predictions fall below the significance threshold levels for receptor 1 (30 hours per year). However, the shadow flicker at receptor 2, is predicted to exceed the significance threshold for both daily and annual shadow flicker.

Given that the Applicant has committed to zero shadow flicker (subject to the time needed for the safe shutdown of the turbines) mitigation in the form of curtailment is required.

Curtailment involves the use of software to shut the turbine down when conditions predict that shadow flicker.

The effectiveness of the curtailment will be monitored by suitably qualify individuals and further mitigation measures considered (such as screening or installing blinds) considered if necessary.

There are no predicted cumulative effects as, although the study area overlaps with the shadow flicker envelope for Knocknamork windfarm, this only affects the properties to the south of the Proposed Development Site.

16 Material Assets (including Telecommunications and Aviation)

Chapter 16 of the EIAR assesses the effects on human original material assets with the potential to be affected by the Proposed Development. These are:

- Aviation;
- Telecommunications; and
- Resources and Utility Infrastructure (including electricity, gas, water, waste and quarries).

Aviation

Pre-application consultation identified the need for the turbines to be fitted with infrared obstacle lighting to allow the hazard posed by the turbines to be identified by military aircraft in flight.

An Aviation Impact Assessment as required by the Irish Aviation Authority was undertaken which determined that the Proposed Development would not represent a physical obstacle to the safe operation of Cork and Kerry airports.

Due to the distance between the Proposed Development Site and these airports, it is unlikely that the Proposed Development would have an impact on communication, navigation or radar systems

During the erection of the wind turbines, cranes will be fitted with appropriate aviation warning lighting to alert pilots to the presence of tall structures.

The Proposed Development will not have any significant effects on aviation.

Telecommunications

There are five telecom operators with networks in the vicinity of the Proposed Development Site.

A telecommunications impact assessment was undertaken that determined that there was sufficient clearance between the Proposed Development infrastructure and the active telecommunication links so that no significant effects will occur during the erection and operation of the turbines

During the construction and decommissioning phase, there are likely to be several sources of temporary electromagnetic emissions. Including the brief use of electrical power tools and the use of electrical generators which may be brought onsite before mains electricity is provided.

These devices are required by Irish and European law to limit electromagnetic emissions from these devices and so will not cause interference to telecommunication and radio equipment.

No significant residual effects are predicted on telecommunications or radio reception as a result of the Proposed Development.

Quarries

There are no quarries located within the Proposed Development or in the immediate vicinity.

The construction of the Proposed Development will impact on natural resources such as aggregates which will be sourced from the quarries in proximity to the Proposed Development Site. The source quarry will be chosen based on stone which is geologically and chemically similar to that occurring at the Proposed Development.

It is likely that a small amount of granular material may be required to maintain access tracks during operation which could impact the source quarry. However, the decommissioning phase will have no impact on the source quarry.

The very nature of a quarry is that it will be subject to cumulative effects as it is the source of stone for almost all developments in the area. The use of imported material will have a slight, permanent negative impact on non-renewable resources of the area. This impact is considered to be imperceptible in the long-term.

Electricity and Infrastructure

The Proposed Development includes of a 3.6km underground grid connection route to Ballyyouskill 220/110kV substation.

The nearest overhead electricity line is the Clonkeen to Clashavoon 110kV line which runs northwest - southeast on the opposite side of the N22 from the proposed Site entrance.

No electricity lines have been identified with the potential to be affected by the Proposed Development.

Other Utilities (Gas Utilities, Water and Waste)

There are no gas mains located within the Proposed Development Site. Gas Networks Ireland have responded to a consultation request confirming there are no existing services along the Grid Connection Route or Turbine Delivery Route. There is therefore no potential for impact.

A section of the River Flesk approximately 5 km downstream from the Proposed Development Site was identified as a drinking water source. As the Proposed Development will not have any significant effects on the River Flesk (see Section 11 abve), this water source will be similarly unaffected.

A desk study of available information from the Environmental Protection Agency did not identify any waste facilities, illegal waste activities, chemical monitoring points or industrial licensed facilities within 5km of the Proposed Development.

No significant effects are assessed as likely to occur during the construction phase in respect of utility infrastructure.

No significant negative impacts on material assets have been identified.

17 Risks and Major Accidents

Chapter 17 of the EIAR considers the potential significant effects on the environment arising from the vulnerability of the Proposed Development to risks of major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Development and consequently have potential impacts on the environment. These include accidents during construction and operation caused by operational failure and/or natural hazards.

Accordingly, this assessment determines:

- The relevant major accidents and/or natural disasters, if any, that the Proposed Development could be vulnerable to;
- The potential for these major accidents and/or natural disasters to result in likely significant adverse environmental effect(s); and
- The measures that are in place, or will be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster.

The potential risks to the Proposed Development are:

- Extreme weather such as storms and heavy snow which may impact construction personnel or incomplete infrastructure. This will be mitigated by ceasing construction when severe weather is forecast. When operational the Proposed Development will not be vulnerable to extreme weather;
- Flooding. This is considered as part of the hydrology assessment (see Section 11 above) which has determined that the site is not at risk of flooding;
- Fire. A major wildfire at the site could cause serious damage. However, such incidents are rare removing personnel from site when a Fire Danger Notice is issued would limit the potential consequences; and
- Terrorism. There has never been a terrorist attack on renewable electricity infrastructure and the distributed nature of the infrastructure on site makes any deliberate attack unlikely to cause significant damage.

The potential risks posed by the Proposed Development are:

- Increased risk of flooding through alteration of the natural drainage patterns. The Proposed Development will require the removal of forestry, however, this would not be dissimilar to the current felling patterns and would not alter the Site drainage significantly. No impermeable surfaces are proposed that would increase the rainfall run off rates;
- Peat Landslide caused by the installation of the Proposed Development infrastructure. This is considered as part of the soils and geology assessment (see Section 10 above). The Proposed Development Site poses a low peat landslide risk and measures will be taken to ensure that risk is not increased during construction;
- Contamination and ecological harm caused by the discharge of polluting liquids. The construction of the Proposed Development will require the temporary storage of

a small amount of fuel and other chemicals. These will be safely stored away from sensitive receptors;

- Traffic collisions caused by the increase in traffic as a result of the Proposed Development. A review of accident statistics. Assuming a linear relationship between traffic collisions and traffic volumes and taking into account the predicted increase in traffic as a result of the Proposed Development, it has been determined that the Proposed Development would not result in a single additional collision over the construction period;
- Fire or uncontrolled explosion. Taking in account the required controls in terms of storage and handling, there is minimal risk of fire or uncontrolled explosion as a result of any material stored or used on the Proposed Development Site during construction. Fires on operational wind turbines are rare and have resulted in damage to the hub of the turbine only; and
- Industrial Accidents. A review of available statistics of incidents related to the construction and operation of onshore windfarms indicates that the likelihood of an incident occurring is less than one for any given year.

The Development has been designed and built-in accordance with the best practice measures set out in this EIA Report and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design.

The assessment concludes that the risk of the Proposed Development to major accidents/natural disasters is low and not significant in every category assessed. No significant cumulative risks have been identified.

18 Interactions of the Foregoing

Chapter 18 of the EIA Report assesses the potential for interaction between the significant effects and the measures to mitigate those effects identified in Chapters 5-17 of the EIAR.

There is one significant interaction between Chapter 14 Archaeology, Architectural and Cultural Heritage and Chapter 6: Landscape and Visual Impact Assessment.

Chapter 14 Archaeology, Architectural and Cultural Heritage has identified that the Proposed Development (operational phase) will have a long-term negative moderate (indirect –visual) effect on the surrounding archaeological, architectural and cultural heritage landscape, specifically The Paps Archaeological Landscape.

Chapter 6: Landscape and Visual Impact Assessment identifies a significant effect on the landscape resources within the Proposed Development Site and on the Kerry County Council Visually Sensitive Area during the operational phase of the Proposed Development. This area partially overlaps with the Paps Archaeological Landscape. The interaction of the effects on these designated areas is considered to be a significant effect.

Therefore, the interaction of the effects of the Proposed Development during the operational phase on the Visually Sensitive Area in the area partially overlapping with the Paps Archaeological Landscape is considered to be a significant effect.

No other significant effects have been identified.

19 Mitigation Measures

Where any potential negative impacts have been identified, mitigation measures to reduce those impacts have been identified and included in the relevant Chapters of the EIAR. The implementation of these mitigation measures will reduce or remove the potential for these effects. Information on potential residual effects and their significance is also presented in each relevant Chapter.

These measures can include:

- Changes to the Proposed Development design;
- Physical measures applied on site; and
- Measures to control particular aspects of the construction or operation of the Proposed Development.

A summary of all the mitigation measures identified is included in Chapter 19: Schedule of Mitigation.