

**RWE Renewables UK Developments Ltd  
Enoch Hill Wind Farm Variation Application**

Scoping Report



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### Report for

Simon Lejeune  
Onshore Wind Development Manager  
RWE Renewables UK Developments Ltd  
Greenwood House  
Westwood Business Park  
Coventry  
CV4 8TT

---

### Main contributors

John Amy  
Giles Hine  
Jess Welch  
Gareth Hughes  
Tori Park  
Rohan Sinha  
Adam Mealing  
Adrian Simms  
Pete Clark  
Glen Robson

---

### Issued by



.....  
Gareth Hughes

---

### Approved by



.....  
Glen Robson

---

### Wood Environment & Infrastructure Solutions UK Ltd

Partnership House  
Regent Farm Road  
Gosforth  
Newcastle upon Tyne NE3 3AF  
United Kingdom  
Tel +44 (0) 191 272 6100

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### Document revisions

No.	Details	Date
1	Draft Report	January 2020
2	Final Report	February 2020

# Executive summary

## Purpose of this report

This report sets out the proposed scope of the Environmental Impact Assessment (EIA) for a proposed variation to the consented Enoch Hill Wind Farm, the findings of which will be presented in an EIA Report. This purpose of this document is to serve as a formal request to the Scottish Ministers to provide a scoping opinion under Regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

This scoping request will inform the EIA of a forthcoming variation application under section 36C of the Electricity Act 1989 (as amended) to vary the section 36 consent and deemed planning permission to construct and operate Enoch Hill Wind Farm. The Variation Development would comprise an increase of turbine hub heights and rotor diameter to maximise potential renewable energy generation, with the locations of all 16 turbines remaining unchanged.

## Summary Findings of the Scoping Report

The proposed variation to the consented Enoch Hill Wind Farm would increase the rotor diameter of all 16 turbines from up to 106m to up to 136m and the tip height from up to 130m to up to 149.9m. All other infrastructure elements would remain unchanged.

The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations December 2017 make it clear that for a variation application relating to an EIA development, further assessment required to inform the application should only consider the impacts of the variation itself rather than requiring the whole development to be assessed again. As the variation to the Consented Development relates to an increased rotor diameter and maximum blade tip height of turbines, with all other infrastructure, construction programme, decommissioning proposals etc. remaining unchanged, the EIA will focus on any significant effects likely to arise during the operation of the Variation Development only. Impacts during construction and decommissioning of Enoch Hill Wind Farm and as a result of infrastructure other than turbines will remain as assessed in the 2015 ES and 2017 Further Environmental Information (FEI) and will therefore not be repeated in the EIA Report for the Variation Development.

The EIA for this variation application will primarily draw on the previous baseline information that informed the 2015 ES and 2017 FEI to allow the impacts resulting from the proposed increase in rotor diameter and blade tip height to be assessed - and directly compared with impacts resulting from the consented development. This scoping report draws on this baseline information to identify where significant effects are likely as a result of the proposed increase in turbine rotor diameter and blade tip height.

The following environmental topic areas are proposed to be scoped out of the EIA on the basis that the proposed increase in blade tip height and rotor diameter will result in little or no change to the magnitude of impacts previously assessed for the Consented Development, therefore the proposed variation is not likely to result in any significant effects in respect of the following:

- Historic Environment (Chapter 9);
- Traffic and Transport (Chapter 13);
- Geology/ Hydrology/Hydrogeology (Chapter 12);

- Socio-economics (Chapter 14); and
- Shadow flicker (Chapter 7).

The following environmental topic areas are proposed to be included in the EIA:

- Landscape and Visual (Chapter 8);
- Ornithology (in relation to collision risk only) (Chapter 11);
- Ecology (effects on bats only) (Chapter 10);
- Noise (Chapter 6);
- Aviation( Chapter 16); and
- Infrastructure, Telecommunications and Safety (Chapter 15).

## Terminology

For the purposes of this report the following terminology is used:

- The '**Consented Development**' - the 16 turbines and associated infrastructure of Enoch Hill Wind Farm as described in the consent granted by the Scottish Ministers in September 2019;
- The '**Variation Development**' - the revised wind farm subject to the 2020 EIA. The variation proposed is to increase the rotor diameter and blade tip height of all 16 turbines, with their locations and all other associated infrastructure remaining unchanged;
- The '**2015 ES**' - the Enoch Hill Wind Farm Environmental Statement that accompanied a section 36 application for a 19T proposed development that was located on the same site as the Consented Development;
- The '**2017 FEI**' – Further Environmental Information that was submitted in 2017 in support of the Consented Development. This considered an amendment to the (then) Proposed Development by way of the deletion of three turbines and change to the locations of those remaining, with this 16T layout being consented in September 2019;
- The '**Development Site**' means the site of the Consented Development located approximately 5km to the south west of New Cumnock and approximately 7km north east of Dalmellington and centred at National Grid Reference (NGR) E257360, N608630 and shown on **Figure 1.1** in **Appendix A**; and
- The 'Applicant' is RWE Renewables UK Developments Ltd (the applicant for the variation is the same legal entity that sought and holds the benefit of the section 36 consent for the Consented Development, but the company name changed from E.ON Climate & Renewables UK Developments Ltd, further to the acquisition of the E.ON business by RWE Renewables on 30 September 2019).



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# 1. Introduction

## 1.1 Introduction

- 1.1.1 In September 2019, Enoch Hill Wind Farm gained section 36 consent and deemed planning permission from Scottish Ministers. The Consented Development comprises 16 wind turbines and associated infrastructure. The Development Site is located approximately 5km to the south west of New Cumnock and approximately 7km north east of Dalmellington and centred at National Grid Reference (NGR) E257360, N608630, with the general site location shown on **Figure 1.1** in **Appendix A**.
- 1.1.2 RWE Renewables UK Developments Ltd (the 'Applicant')<sup>1</sup> is proposing to submit a variation application under section 36C of the Electricity Act (1989) (as amended) to construct and operate a wind farm with a generating capacity in excess of 50MW on the site of the Consented Development. The 'Development Site' boundary and turbine locations of the Consented Development and the 'Variation Development' are identical. The proposed variation comprises an increase in rotor diameter, the maximum blade tip heights of all 16 turbines (as shown in **Table 2.1**) and an increase in the operational period from 25 to 30 years. The proposed increase in rotor diameters and blade tip height would increase potential renewable energy generation within the Development Site with no requirement to change other associated infrastructure.
- 1.1.3 Maximum blade tip height of all 16 turbines of the Consented Development is 130m and the proposed variation would increase their tip height to a maximum of 149.9m to accommodate an increase in rotor diameter from up to 106m to up to 136m. All other infrastructure elements would remain the same. The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations December 2017 make it clear that for a variation application relating to an EIA development, further assessment required to inform the application should only consider the impacts of the variation itself rather than requiring the whole development to be assessed again.
- 1.1.4 In recognition of the scale and nature of the Variation Development, the Applicant will undertake an EIA to assess potentially significant environmental effects resulting from the proposed changes to the turbine parameters. Under section 36 of the Electricity Act 1989 (as amended), the Variation Development would require authorisation from the Scottish Ministers as it would require a variation to the terms of a section 36 consent for a power generating station in excess of 50MW.

## 1.2 Contents of this Report

- 1.2.1 This report sets out the proposed scope of the EIA for the Variation Development, which is to be submitted to the Scottish Ministers as a formal request for a scoping opinion. A scoping opinion is defined under the EIA Regulations as *"as opinion adopted by the Scottish Ministers as to the scope and level of detail of information to be provided in the EIA Report"*. The purpose of this Scoping Report is therefore to:

- Define the Variation Development being considered (**Chapter 2**);

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<sup>1</sup> E.ON Climate & Renewables UK Developments Ltd, the applicant for the Consented Development, was acquired by RWE Renewables on 30 September 2019. The legal entity remains the same, although the company name has been changed, and the applicant for the proposed variation is the person entitled to the benefit of the section 36 consent for the Consented Development.

- Describe the consenting and EIA requirements in relation to the Variation Development (**Chapter 3, Chapter 4**);
- Outline the aspects of the Variation Development that could potentially result in significant environmental effects (**Chapter 3**) and, where potentially significant effects may result, the methodologies that will be used to assess potential impacts (**Chapter 5 – 16**);

## 1.3 The Applicant

- 1.3.1 The 'Applicant' is RWE Renewables UK Developments Ltd (the applicant for the variation is the same legal entity that sought and holds the benefit of the section 36 consent for the Consented Development, but the company name changed from E.ON Climate & Renewables UK Developments Ltd, further to the acquisition of the E.ON business by RWE Renewables on 30 September 2019).
- 1.3.2 RWE Renewables produces electricity from renewable energy sources. RWE has become a "super player" in the field of renewables. We are the global number two in offshore wind. We have a goal: to become climate-neutral by 2040. In order to achieve this goal, we are reducing our CO<sub>2</sub> emissions as quickly and drastically as possible, by phasing out or converting conventional power plants. We already cut our greenhouse gas emissions by 60 million tonnes of CO<sub>2</sub> between 2012 and 2018. That is a 33 per cent reduction. No other company in Germany has achieved more in the last few years. We are determined to continue this.
- 1.3.3 Together, our employees drive forward new, innovative technologies and implement exciting projects. We are planning to invest billions of pounds net annually in expanding renewables and developing storage technologies. We are focusing on the American continent, the European core markets such as the UK as well as new markets in Asia-Pacific. We have plenty of projects in the pipeline, spanning all technologies: offshore and onshore wind as well as photovoltaics. We are currently building the largest European onshore wind farm in Sweden and the largest solar power plant in Australia.

## 1.4 The Agent

- 1.4.1 Wood Environment & Infrastructure Solutions UK Limited, part of the international Wood brand supplying consultancy, engineering and project management services across the globe, has been commissioned to prepare this scoping report.
- 1.4.2 Wood includes one of the UK's largest multidisciplinary environmental and engineering consultancies within the Environment & Infrastructure Solutions UK business (previously Amec Foster Wheeler, Amec and Entec UK prior to acquisitions) and operates from 12 office locations. With skills ranging from development planning and design through an array of environmental and engineering disciplines, we have a comprehensive service portfolio and applied experience in a wide range of markets.
- 1.4.3 The EIA will be carried out by Wood to standards that comply with quality standards identified by the Institute of Environmental Management and Assessment (IEMA). The EIA Quality Mark scheme was introduced in 2011 and Wood (through its previous entities Amec Foster Wheeler, Amec and Entec UK) was a founder member and has held continuous membership since then. Each year, Wood is required to show that it meets seven commitments relating to EIA management, team capabilities, regulatory compliance, EIA context and influence, EIA content, and improving EIA practice. Wood's approach to these matters are examined by IEMA through several methods,

including reviewing EIA reports we produce, interviewing staff, case studies provided for IEMA to publish and presentations made at conferences.

- 1.4.4 Wood requests a '*Scoping Opinion*' from the Scottish Ministers in relation to a proposal to vary certain parameters for a >50MW consented wind farm ( the Consented Development).

## 2. Project Description

### 2.1 The Development Site

- 2.1.1 The Development Site (centred at National Grid Reference (NGR) E257360, N608630 and shown on **Figure 1.1 in Appendix A**) for the Variation Development is the same as for the Consented Development. It is located in East Ayrshire approximately 5km to the south west of New Cumnock and approximately 7km to the north east of Dalmellington, close to the northern border of Dumfries and Galloway Council. The B741 runs in an east - west direction along the northern part of the Development Site, connecting the aforementioned settlements of Dalmellington and New Cumnock. Carsphairn Forest is located to the west and south of the Development Site boundary, with open cast mining to the north and open moorland to the east.
- 2.1.2 The majority of the Development Site is rough grazing land and extends to approximately 1,466ha hectares (ha), although the wind farm infrastructure would occupy only a small part of it.
- 2.1.3 The elevation of the Development Site is between 210m – 569m above ordnance datum (AOD) with the topography being characterised by five summits; Peat Hill, Rigg Hill, Enoch Hill, Chang Hill and Benty Cowan Hill. The highest of these is Enoch Hill at 569m above ordnance datum (AOD).
- 2.1.4 The Development Site access will be created off the B741 that runs along its northern boundary. The new access will be located a short distance to the north east of Polmathburn Bridge, on the north western edge of the Development Site boundary and abnormal loads will not cross this bridge. The new access will be used for all phases of the Variation Development (construction, operation and decommissioning).

### 2.2 Historic and Current Development Site Uses

- 2.2.1 The Development Site is owned by three landowners and is primarily used for sheep grazing. [There has been no change in ownership or the primary use of the Development Site since the grant of the section 36 consent for the Consented Development.]

### 2.3 Background Context: Consented Development

- 2.3.1 The Consented Development comprises the construction, operation for a period of 25 years and decommissioning of a wind farm with a maximum generating capacity exceeding 50MW. It consists of up to 16 turbines, with a blade tip height of up to 130m, and associated infrastructure as summarised in **Table 2.1**. The application was accompanied by the 2015 ES (up to 19 turbine layout) and 2017 FEI (up to 16 turbine layout as consented), both prepared by Amec Foster Wheeler (now Wood following acquisition).

### 2.4 The Variation Development

#### Rationale for the Variation Development

- 2.4.1 A result of the greater availability of larger, more efficient turbines since the section 36 application was submitted and by taking into account the results of further on-site wind monitoring

undertaken since the Consented Development application was submitted, the Applicant has calculated that the generation capacity can be significantly increased from the 54.4MW referenced in the 2017 FEI up to a potential 80MW by a relatively modest increase in the height of the turbines. This, along with preliminary assessment work which has shown that there should only be a limited increase in any environmental effects, has led the Applicant to undertake an EIA for the Variation Development described.

## Project Description

- 2.4.2 The Variation Development would comprise the construction and operation of up to 16 wind turbines, in the same locations as for the Consented Development, with the following main elements:
- An increase in the operational period from 25 years to 30 years;
  - Up to 16 wind turbines with rotor diameters up to 136m and blade tip heights up to 149.9m;
  - Access tracks connecting infrastructure elements;
  - A new vehicular access point from the public highway;
  - Hard standing areas e.g. crane pads;
  - Potential borrow pit(s);
  - Two anemometer masts;
  - Temporary working areas e.g. construction compound; and
  - Control building and substation and electrical cabling between this and the turbines.

## Wind Turbines

- 2.4.3 The candidate turbine models (and power output per turbine) would be selected through a competitive tendering exercise and as such these details of the Variation Development have yet to be finalised. The proposed increase in maximum rotor diameter from 106m to 136m and maximum blade tip height from 130 to 149.9m under the Variation Development will allow an increased generating capacity per turbine; and while the total installed capacity of the Proposed Development will be confirmed once the turbine model is selected, it will exceed 50MW up to a potential 80MW.
- 2.4.4 The turbines for the Variation Development would not exceed 136m rotor diameter and 149.9m to blade tip height and the indicative turbine coordinates remain unchanged from the Consented Development, as presented in **Table 2.1**, with the Site Layout shown on **Figure 1.2** in **Appendix A**.

Table 2.1 Turbine Coordinates

Turbine	Location (NGR)
1	E 255563, N 607866
2	E 255934, N 608200
3	E 255716, N 607356
4	E 256142, N 606876
5	E 256373, N 608072

Turbine	Location (NGR)
6	E 256490 N 607097
7	E 256621, N 606524
8	E 256651, N 607737
9	E 256920, N 607348
10	E 257209, N 607066
11	E 257160, N 607685
12	E 257360, N 606678
13	E 257491, N 607348
14	E 257659, N 608057
15	E 256028, N 607726
16	E 256400, N 606200

### Other Infrastructure

- 2.4.5 All other infrastructure elements would be as described in Chapters 4 of the 2015 ES and 2017 FEI and as shown on **Figure 1.2** in **Appendix A**.

### Timeframes

- 2.4.6 The Variation Development would be designed with an operational life of 30 years (a proposed increase to the operational period of 25 years which has been consented). Following this, provided there has been no approval to extend the life, it is expected that the wind farm would then be decommissioned.



## 3. EIA Process and Consultation

### 3.1 EIA Overview

- 3.1.1 EIA is a systematic process that must be followed for certain categories of project before they can receive development consent. It aims to identify a project's likely significant effects through the scoping process, and then assess those effects in an EIA Report. This helps to ensure that the importance of the predicted effects and the scope for mitigation measures to reduce them are properly understood by the public and, in this instance, the Scottish Ministers before it makes its decision.
- 3.1.2 The EIA process should be systematic, analytical, impartial, consultative and iterative, allowing opportunities for environmental concerns to be addressed in the design of a project. Typically, a number of design iterations take place in response to environmental constraints identified during the EIA process prior to the final design being reached.
- 3.1.3 The EIA should be based upon recognised good practice and guidelines specific to each technical area and identify the likely significant environmental effects arising from a proposed development. Consultees are also encouraged to provide confirmation of agreement to the proposed scope in terms of what is included and excluded, the methodology and the receptors identified.

### 3.2 EIA Terminology

#### Impacts and Effects

- 3.2.1 EIA is concerned with the identification of likely significant effects on the environment. However, the terms *impact* and *effect* are often used synonymously and this can lead to confusion. For clarity, the convention used in this assessment is to use 'impacts' within the context of the term EIA, which describes the process from scoping through ES preparation to subsequent monitoring and other work. Otherwise, this document uses the word 'effects' when describing the environmental consequences of the Variation Development. For example, such effects may come about as a result of the following:
- Physical activities that would take place if the development were to proceed (e.g. vehicle movements during construction operations);
  - Environmental changes that are predicted to occur as a result of these activities (e.g. loss of vegetation prior to the start of construction work or an increase in noise levels). In some cases one change causes another change, which in turn results in an environmental effect.
- 3.2.2 The predicted environmental effects are the consequences of the environmental changes for specific environmental receptors. For example, with respect to bats, the loss of roosting sites or foraging areas could affect the bats' population size; with regard to people, an increase in noise levels could affect amenity.
- 3.2.3 This assessment is concerned with assessing the significance of the environmental effects of the Variation Development, rather than the activities or changes that cause them. However, this requires these activities to be understood and the resultant changes identified; often based on predictive assessment work.

## Type of Effect

- 3.2.4 The 2017 EIA Regulations (Schedule 4, Part 1) require consideration of a variety of types of effect, namely direct / indirect, secondary, cumulative, positive / negative, short / medium / long-term, and permanent / temporary. In the EIA Report that will follow this scoping report, effects are considered in terms of how they arise, their nature (i.e. whether they are positive or negative) and duration. Each will have a source originating from the development, a pathway and a receptor and may fall into one of several categories:
- Direct effects are readily identified because of the physical connection between some element of the development and an affected receptor;
  - Indirect effects require some additional pathway for the effect to arise. For example, a listed building may not be directly affected by any elements of a development but its setting may be if the development is visible in views from it or when looking towards it; in which case there would be an indirect effect;
  - Secondary effects would typically require further pathway connections, for example, an effect on a receptor population A could have a secondary effect on receptor population B, if B was itself dependent on A in some way, as, for example, a food source; and
  - Cumulative effects arise when the receptors affected by one development are also affected by other developments resulting in the aggregation of environmental effects or the interaction of impacts.
- 3.2.5 Most predicted effects will be obviously positive or negative, and will be described as such. However, in some cases it is appropriate to identify that the interpretation of a change is a matter of personal opinion, and such effects will be described as 'subjective'.

## Temporal and Spatial Scope

- 3.2.6 In its broadest sense, the spatial scope is the area over which changes to the environment would occur as a consequence of the development. In practice, an EIA should focus on those areas where these effects are likely to be significant.
- 3.2.7 The spatial scope varies between environmental topic areas. For example, the effect of a proposed development on the landscape resource and visual amenity is generally assessed within a zone of up to 35km from the wind turbines (and potentially up to 70km for cumulative effects), whilst noise effects are assessed within a much smaller area encompassing those representative properties close to a development site.
- 3.2.8 The temporal scope is stated where known and effects are typically described as:
- Temporary – likely to be related to a particular activity and will cease when the activity finishes. The terms 'short-term' and 'long-term' may also be used to provide a further indication of how long the effect will be experienced; and
  - Permanent – this typically means an unrecoverable change.
- 3.2.9 Effects are generally considered in relation to the following key stages of a proposed development:
- Construction – the effects may arise from the construction activities themselves, or from the temporary occupation of land. Effects are often of limited duration although there is potential for permanent effects. Where construction activities create permanent change, the effects will continue into the operational period;

- Operation – effects may be permanent, or they may be temporary, intermittent, or limited to the life of a proposed development until decommissioning (as in the case of wind power developments which gain planning permission for a defined and finite number of years); and
- Decommissioning - effects may arise from the decommissioning activities themselves, or from the temporary occupation of land. The effects would generally be temporary and of limited duration. Additional permanent change would normally be unlikely unless associated with restoration.

### 3.3 EIA Scoping

3.3.1 The results of the EIA process are reported in an EIA Report and Schedule 4(4) of the EIA Regulations specifies that it should describe:

*"...factors...likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape."*

3.3.2 Regulation 4(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 4(4) requires EIA Reports to consider:

*"...the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters."*

3.3.3 Establishing which aspects of the environment are likely to be significantly affected by a particular project is captured in the EIA scoping process, which aims to identify those aspects of the environment and associated issues that need to be considered when assessing the potential effects resulting from a proposed development. This recognises that there may be some environmental elements for which the project is unlikely to have a significant effect, and hence where there is no need for further investigation to be undertaken as part of the EIA.

3.3.4 This scoping report draws existing baseline data and assessment work from the 2015 ES and 2017 FEI to identify where significant effects are likely in terms of each of the relevant environmental topics. This provides a robust process to 'scope in' those environmental receptors where significant effects are likely as a result of the proposed variation, and to 'scope out' those where significant effects are unlikely.

3.3.5 The proposed scope of the EIA for the Variation Development is set out in the following chapters of this report (for ease of cross referencing, the same topic chapter numbers and headings as were used in the 2015 ES and 2017 FEI will be maintained for the Variation Development EIA Report). Potentially significant effects as a result of the Variation Development are summarised for each environmental topic area<sup>2</sup>, and any such effects would be carried forward into the relevant EIA Report chapter.

3.3.6 The scope is cognisant of The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations December 2017 which make it clear that for a variation application relating to an EIA development, further assessment required to inform the application should only consider the impacts of the proposed variation itself and how those differ from those previously identified in the relevant EIA report or environmental statement. As the variation to the Consented

<sup>2</sup> Where an effect cannot be confirmed as being 'not significant' these will be 'scoped in' to the assessment.

Development primarily relates to an increase in the operational period, increased rotor diameter and maximum blade tip height of turbines, with all other infrastructure, construction programme, decommissioning proposals etc. all remaining unchanged, the EIA will focus on effects likely to arise during the operation of the Variation Development. Impacts during the construction and decommissioning phases and as a result of infrastructure other than turbines remain as assessed in the 2015 ES and 2017 FEI and will therefore not be repeated in the EIA Report for the Variation Development. The exception to this related to the delivery of larger turbine blades and tower sections to the Development Site during the construction phase and additional Swept Path Analysis (SPA) will therefore be carried out.

3.3.7 On this basis, elements which have been scoped into the operational phase EIA are:

- Landscape and Visual (Chapter 8);
- Collision risk for birds and bats (Chapters 11 and 10);
- Noise (Chapter 6);
- Aviation (Chapter 16); and
- Infrastructure, Telecommunications and Safety (Chapter 15).

3.3.8 For those elements which have been scoped out, an appropriate justification for this is provided.

3.3.9 The scope and assessment methodologies proposed in the subsequent technical chapters of this scoping report are based on recognised good practice and guidelines specific to each topic area. The environmental topic chapters identify where significant effects are anticipated as a result of the Variation Development and take into account:

- The baseline data from the 2015 ES, and the 2017 FEI where appropriate;
- The description of the Variation Development;
- Changes to guidance on assessment methodologies (if any);
- Existing conclusions regarding significant effects for the Consented Development and the decisions made by the Scottish Ministers (where relevant); and
- Any cumulative effects, which may arise.

## 3.4 Cumulative Effects

3.4.1 Cumulative effects can arise from the interaction between a proposed development and other developments already built or proposed. In line with standard practice, for the purpose of the EIA, other wind farm developments which are operational (and not already part of the baseline), subject to planning approval or subject to a full and validated planning application will be included in the consideration of potential cumulative effects (subject to a cut-off point to allow assessments to be undertaken). It should be noted that not all of the cumulative developments would necessarily have a cumulative effect in respect of any particular environmental topic.

## 3.5 Mitigation

3.5.1 Some mitigation measures to avoid, reduce or offset the consequences of the Variation Development would be embedded within its design whilst others may require adherence to

particular constraints on construction methodology or mode of operation. The final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Variation Development (i.e. it will be the assessment of residual effects).

## 3.6 EIA Methodology

- 3.6.1 The EIA Report will identify the assessment methodologies based on recognised good practice and guidelines specific to each of the relevant environmental topic areas where the proposed variation could result in significant effects. In general terms, the technical studies undertaken for each topic area and chapter included in the EIA Report to accompany the variation application would include:
- Baseline information about the receiving environment, largely based on the baseline presented within the 2015 ES and 2017 FEI, together with identification of any relevant trends in, or evolution of, the baseline;
  - Consultation with experts and relevant consultees as necessary;
  - Consideration of the potential effects of the Variation Development on the baseline, followed by identification of any additional mitigation measures to seek to avoid or reduce any predicted adverse effects;
  - Assessment and evaluation of any residual significant effects after mitigation measures have been implemented; and
  - Compilation of the EIA Report chapter.

## 3.7 Consultation

- 3.7.1 Consultation is an essential element of the EIA process and will be reported within the EIA Report and supporting documentation as necessary.
- 3.7.2 The Applicant is committed to promoting dialogue with statutory and non-statutory consultees and the local community, seeking to engage with all those with an interest in the Variation Development to provide transparency during the process.



## 4. Planning Policy Context

### 4.1 Introduction

- 4.1.1 The EIA will be progressed taking account of applicable legislation, policy and guidance. This chapter outlines the planning policy framework followed by an overview of further legislation, policy and guidance pertinent to the Variation Development.
- 4.1.2 The section 36C application will be accompanied by a Planning Statement, which will set out the planning case for the Variation Development with regards to local and national policies and other material considerations.

### 4.2 Regulatory Framework

- 4.2.1 The application for the Variation Development would be made pursuant to section 36C of the Electricity Act 1989 (as amended) to vary the extant section 36 consent for Enoch Hill Wind Farm.
- 4.2.2 The Electricity Generating Stations (Applications for Variation of Consent) (Scotland) Regulations 2013 set out the procedures and information requirements for applications to vary an existing consent. The section 36C application for the Variation Development would be prepared and submitted in accordance with information requirements set out within these Regulations.
- 4.2.3 Section 57 (2ZA) of the Town and Country Planning (Scotland) Act 1997 ('the Act') provides for Scottish Ministers to vary the direction for 'deemed planning permission' given under section 57(2) of the Act in relation to the Consented Development.
- 4.2.4 The EIA Regulations provide the requirements for undertaking EIAs for developments to be consented under the Electricity Act 1989 (as amended). The EIA Report would be prepared in accordance with Schedule 4 of the Regulations.

### 4.3 Scottish Planning Policy & Guidance

- 4.3.1 There are legal, policy and advice documents which would be material considerations in the determination of the section 36C application for the Variation Development, including those noted in the following sections:

#### National Planning Framework 3 (NPF3)

- 4.3.2 NPF3 (June 2014) provides the statutory framework for Scotland's long term spatial development. It sets out the Scottish Government's spatial development priorities over a 20 to 30 year period, and what is expected of the planning system and the outcomes it must deliver. NPF3 reaffirmed the Scottish Government's commitment, at the time of publication, to renewable energy targets (30% of overall energy demand from renewable sources by 2020 and recognises the important role of onshore wind in achieving these targets. The Framework supports the deployment of appropriately located onshore wind energy development. It should be noted that preparation for NPF4 is underway.

### Scottish Planning Policy (SPP)

- 4.3.3 SPP (June 2014) sets out national planning policies that reflect the priorities of the Scottish Ministers for the operation of the planning system and the development and use of land through sustainable economic growth. The SPP recognises that renewable energy generation including onshore wind will contribute to more secure and diverse energy supplies and support sustainable economic growth. The commitment to increase the amount of electricity generated from renewable sources including onshore wind is a vital part of the response to climate change. It should be noted that the Scottish Government is currently undertaking a process to reform the planning policy and the intention is that the next version of SPPP will be incorporated into the NFP and thus be a statutory requirement.

### National Planning Advice, Circulars and Advice Sheets

- 4.3.4 National planning policy is supported by Planning Circulars, Planning Advice Notes (PANs) and Specific Advice Sheets and Ministerial / Chief Planning Letters to Planning Authorities, which set out detailed advice from the Scottish Government in relation to a number of planning issues. The PANs and Specific Advice Sheets considered relevant to the Variation Development include:

- Planning and Noise (PAN 1/2011), March 2011;
- Planning and Archaeology (PAN 2/2011), July 2011;
- Community Engagement (PAN 3/2010), August 2010;
- Planning, Environmental Protection and Regulation (PAN 51), October 2006;
- Natural Heritage (PAN 60), January 2000;
- Sustainable Urban Drainage Systems (PAN 61), July 2011;
- Planning for Transport (PAN 75), August 2005;
- Water and Drainage (PAN 79), September 2006;
- Wind Farm Developments on Peat Land, May 2013;
- Specific Advice Sheet: Peatland Survey 2017: Guidance on Developments on Peat Land;
- Specific Advice Sheet (updated 28 May 2014): Onshore Wind Turbines;
- Spatial Planning for Onshore Wind Turbines – Natural Heritage Consideration, June 2015; and
- Chief Planner Letter regarding Energy Targets and Scottish Planning Policy, 2015.

## 4.4 Local Development Planning Policy

- 4.4.1 In considering the overall legal framework within which the Variation Development would be assessed, the terms of the Development Plan are a consideration which should be taken into account in the round with all other relevant considerations; however, section 25 of the Town and Country Planning (Scotland) Act 1997 is not engaged for variation applications pursuant to Section 36C of the Electricity Act 1989 (i.e. the Development Plan does not take primacy in the determination process).





## 5. Renewable Energy Policy, Carbon Balance and Peat Management

### 5.1 Introduction

5.1.1 The EIA will be progressed taking account of applicable legislation, policy and guidance in relation to renewable energy. This section of the EIA Report will set out the policy and energy target context for renewable energy projects from a European, UK and Scottish perspective as well as providing the carbon balance assessment.

### 5.2 Renewable Energy & Climate Change Policy Framework

5.2.1 The following legislation and policy are relevant to the Variation Development and would be considered in the EIA Report:

- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019;
- The Renewable Energy Directive (2009/28/EC);
- The EU 2030 Climate & Energy Policy Framework;
- Climate Change (Scotland) Act 2009;
- Low Carbon Economic Strategy for Scotland 2010;
- Low Carbon Scotland – Meeting the Emissions Reductions Targets 2013-2027;
- The Scottish Government Renewables Action Plan June 2009 and 2011;
- Electricity Generation Policy Statement 2013;
- 2020 Renewables Routemap June 2011, updated October 2012 and December 2013;
- The Scottish Energy Strategy 2017
- Onshore Wind Policy Statement 2017 ; and
- The Climate Change Plan 2018.

### 5.3 Potential Contribution of the Variation Development to Government Objectives

5.3.1 The Scottish and UK legislative and policy framework on climate change is shaped by international climate change legislation. These incorporate binding targets in the reduction of greenhouse gas emissions and in the generation of energy from renewable sources.

5.3.2 In 2019, the Scottish Government amended the Climate Change (Scotland) Act 2009 through the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. The 2019 Act seeks to ensure Scotland achieves its ambition to reduce greenhouse gas emissions to a net-zero state by 2045. In order to achieve this ambition, Scotland will need considerably more renewable energy projects.

- 5.3.3 The Variation Development would utilise more recent turbine technology than available and assumed at the time of the planning application for the Consented Development, which in turn would increase the renewable energy yield and maximise generation within the same footprint. This would make an important and substantial contribution to achieving multiple existing targets regarding the deployment of renewable energy technologies and greenhouse gas emissions reduction in pursuit climate change mitigation.

## 5.4 Carbon Balance Assessment

- 5.4.1 A carbon balance assessment (Appendix 6.C) using the Scottish Government Windfarm Carbon Assessment Tool - Version 2.9.0 was undertaken as part of the 2015 ES. An updated carbon balance assessment will be undertaken using the most up to date version of the Scottish Government Windfarm Carbon Assessment Tool, currently v1.6.0 (November 2019)<sup>3</sup>.

## 5.5 Peat Management

- 5.5.1 A peat management plan (Appendix 6.A) and peat slide risk assessment (Appendix 6.B) were undertaken as part of the 2015 ES.
- 5.5.2 Comprehensive peat probing surveys were carried out to inform these reports in accordance with SEPA's peat depth probing survey guidance at the time. Whilst this guidance was updated in 2017<sup>4</sup>, the survey work carried out to inform the 2015 ES and 2017 FEI remains valid as it complies with the updated SEPA guidance.
- 5.5.3 Since there are no proposed changes to the infrastructure layout within the Variation Development, the results of the Peat Slide Risk assessment remain valid and no update to this is required.
- 5.5.4 The predicted volume of excavated peat is expected to remain unchanged from that set out within Table 2.2 of the revised PMP presented within the 2017 FEI. Table 2.3 in the PMP confirms that all of the excavated peat can be used within the Development Site for habitat reinstatement and this conclusion is unchanged for the Variation Development. As a result, it is considered that no update to the 2017 PMP is required.

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<sup>3</sup> <https://informatics.sepa.org.uk/CarbonCalculator/index.jsp>

<sup>4</sup> <http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/17852-1/CSavings/PSG2011>

## 6. Noise

### 6.1 Introduction

- 6.1.1 The process for and approach to the construction of the Variation Development would be the same as that assessed in the 2015 ES and 2017 FEI, with no significant differences anticipated from the proposed increase in the size of turbines. The results of the construction assessment within the 2015 ES and 2017 FEI showed that due to the high separation distances between works and sensitive receptors a significant effect would be unlikely. As with the 2015 ES and 2017 FEI, noise during decommissioning works would also be scoped out of the assessment as these would be largely similar, though anticipated to be quieter, than during the construction phase of the development.
- 6.1.2 As such, the 2015 ES and 2017 FEI assessment is considered applicable and no further work to update the assessment in respect of the construction and decommissioning phase is required. It is therefore proposed that noise during construction/decommissioning is scoped out of the assessment.
- 6.1.3 The traffic for the maintenance and operation of the wind farm would be minimal and, as with the Scoping Report for the 2015 ES, it is also proposed that this would be scoped out of the assessment.
- 6.1.4 The proposed scope would therefore consist of the assessment of operational noise for the Variation Development, including cumulative noise impacts from proposed, consented and operational wind developments in the area.

### 6.2 Baseline Conditions

#### Data Sources

- 6.2.1 The data sources most relevant to the assessment of noise from the Variation Development are those detailed within the 2015 ES and 2017 FEI, namely the comprehensive background noise monitoring undertaken in 2014.
- 6.2.2 Review of the Development Site using current Ordnance Survey mapping and Aerial Photography has identified no new sensitive receptors that would be considered in addition to those considered within the 2015 ES and 2017 FEI. Therefore, given that there has been no discernible change to the Development Site or the surrounding area within which the 2014 noise monitoring took place, and to allow direct comparison between the noise assessments presented in the 2015 ES and 2017 FEI and the assessment for the Variation Development, no additional noise monitoring is proposed.

#### Summary of Baseline Conditions

- 6.2.3 The site is located in a semi-rural area with the most notable noise source being occasional traffic on the B741.
- 6.2.4 There is no evidence to suggest that the prevailing baseline noise conditions have changed significantly from those presented within the 2015 ES and 2017 FEI. The baseline identification used within the 2015 ES and 2017 FEI followed the latest accepted approach detailed in 'A Good Practice

Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IOA, 2013).

- 6.2.5 The baseline data analysis was undertaken in conjunction with wind speeds at 80 m height, the hub height of the candidate turbine. As the proposed candidate hub height is likely to be approximately 82 m; the original baseline wind shear analysis for the site is still considered appropriate in line with ETSU-R-97. The results of background noise monitoring, and the associated noise limits derived using methodology advocated within the ETSU-R-97 Guidance, would therefore remain applicable for the Variation Development EIA Report.

## 6.3 Methodology

### Operational Noise

- 6.3.1 The proposed operational noise assessment would be undertaken in accordance with 'ETSU-R-97: The Assessment and Rating of Noise from Wind Farms', (ETSU-R-97 Guidance) (1996), and the assessment methodology advocated within the Institute of Acoustics 'A Good Practice Guide to Applications of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IoA GPG) (2013).
- 6.3.2 The ETSU Guidance advises that any noise restrictions placed on a wind farm must balance its environmental impact against the national and global benefits that would arise through the development of renewable energy sources:
- "The planning system must therefore seek to control the environmental impacts from a wind farm whilst at the same time recognising the national and global benefits that would arise through the development of renewable energy sources and not be so severe that wind farm development is unduly stifled".*
- 6.3.3 In this respect, the wind turbine noise levels imposed by Planning Condition 33 of the Consented Development are accepted by the Applicant. The final selection of turbine model for the Variation Development would follow a competitive tendering process and would be required to comply with the noise criterion levels established by planning condition(s). Consideration will also be given to the cumulative effect, taking into account both consented and operational wind farms.
- 6.3.4 The majority of noise related guidance and standards (including the ETSU Guidance) are not directly related to the concepts of 'significant' and 'not significant' effects that underpin EIA. However, for the purposes of the assessment, the determination of effect significance for the operational phase of the Variation Development is based upon compliance with the applicable noise limit i.e. a breach of the noise limits indicates a significant effect, whereas compliance with noise limits indicates an effect which is not significant. As noise levels exceeding the ETSU Guidance noise limits are deemed to be significant, they would require further consideration were this the case; with a view to identifying appropriate mitigation to ensure compliance with the specified limits.

## 6.4 Potential Impacts

### Operational Impacts

- 6.4.1 When operational, wind turbines emit two types of noise – mechanical noise and aerodynamic noise. The main sources of mechanical noise are from internal components housed within the nacelle, such as the gearbox and generator. Mechanical noise from a modern wind turbine is

negligible, as the nacelles are insulated to reduce noise emissions and the various mechanical components housed within the nacelle are acoustically isolated to prevent structure-borne noise.

6.4.2 Aerodynamic noise occurs from the movement of the blades passing through the air. At higher wind speeds, aerodynamic noise is usually masked by the increasing sound of wind blowing through trees and around buildings. The level of masking determines the perceived audibility of the wind farm. The proposed impact assessment establishes the relationship between wind turbine noise and the natural masking of noise resulting from features of the surrounding environment and assesses noise levels against established standards.

6.4.3 For the impact assessment, a range of turbine models appropriate for the Variation Development will be considered. The final selection of turbine would follow a competitive tendering process and thus the actual model of turbine may differ from those upon which the assessment has been based. However, the final choice of turbine will be required to comply with the noise criterion levels which have been established by the Consented Development.

## 6.5 Potential Mitigation

6.5.1 Noise modelling would be undertaken using software adopting the IoA GPG advocated methodologies. In the event that exceedances of the associated noise limits are determined for a specified turbine model, mitigation options would be investigated. These may include: adoption of quieter turbines; reducing the power rating, and thus the noise emission of particular turbines in particular wind environments; or design of a noise management plan which varies the operation of the wind turbines dependent on the existing wind direction.

## 6.6 Summary of Effects

6.6.1 The Variation Development is unlikely to result in any significant effects in terms of construction, operational traffic and decommissioning and therefore it is proposed that these elements are scoped out of the assessment. However, there is the potential for significant effects during the operational phase of the Variation Development and this has been scoped into the assessment.



## 7. Shadow Flicker

- 7.1.1 Shadow Flicker is a phenomenon that can occur in sunny weather when turbines are operating and the rotating blades cause a flickering effect inside a building where sunlight passes through an opening such as a window or door.
- 7.1.2 For shadow flicker to occur, the receptor must be directly in line with the wind turbines when the sun is low in the sky and within 10 rotor diameters of a turbine where they are located within 130 degrees either side of north of any turbine. In these circumstances, the moving turbine blade briefly blocks/reduces the intensity of light entering an opening to a room on each rotation, causing a flickering to be perceived. In the open, shadow flicker is generally not perceived as light outdoors is reflected from all directions.
- 7.1.3 It is stated within the Scottish Government's Onshore Wind Turbines planning advice note (May 2014) that where separation is provided between wind turbines and nearby dwellings (as a general rule, 10 rotor diameters), 'shadow flicker should not be a problem'.
- 7.1.4 The increase in turbine rotor diameter would lead to a larger area of potential effect. However, there are still no residential properties within or close to this area (i.e. within 10 rotor diameters of the Variation Development) and consequently an assessment of shadow flicker effects is scoped out of the EIA.





## 8. Landscape and Visual

### 8.1 Introduction

8.1.1 The objective of the Landscape and Visual Impact Assessment (LVIA) would be to assess the impact of the proposed increase in turbine height in relation to the following:

- Landscape Effects – assessment of effects on areas of landscape character, including key characteristics, elements, landscape qualities and landscape designations;
- Visual Effects – assessment of effects on the views and visual amenity experienced by residents, tourists / visitors, recreational users and road / rail users; and
- Cumulative Effects – assessment of effects in combination with and in addition to other existing, consented and proposed wind farms, referred to as Cumulative Landscape and Visual Impact Assessment (CLVIA).

8.1.2 As the variation to the Consented Development is limited to an increased hub height, rotor diameter and maximum blade tip height of all 16 turbines, with all other infrastructure, construction programme, decommissioning proposals etc. remaining unchanged, the LVIA would consider the landscape and visual effects likely to arise during the operation of the Variation Development only.

### 8.2 Guidance and Reference Material

8.2.1 The LVIA would be undertaken in accordance with best practice guidance including the following:

- *Guidelines for Landscape and Visual Impact Assessment*, Third Edition, Landscape Institute and IEMA (2013);
- *Visual Representation of Windfarms*, Version 2.2, SNH (February 2017);
- *Siting and Designing Windfarms in the Landscape*, Version 3a, SNH (August 2017);
- *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*, SNH (2012);
- *Visual Assessment of Windfarms: Best Practice*, University of Newcastle for SNH (2002): Commissioned Report F01AA303A;
- *Residential Visual Amenity Assessment: Technical Information Note*, Landscape Institute, 15 March 2019; and
- *Visual Representation of Development Proposals Technical Guidance Note 06/19*, Landscape Institute, September 2019.

### 8.3 Baseline Conditions

#### The Study Area

8.3.1 SNH guidance on the *Visual Representation of Windfarms* (February 2017) recommends that for proposed wind farm developments of between 131-150m to blade tip, an initial study area of 40km is used for landscape and visual assessments. The study area is illustrated in **Figure 8.1**. The

guidance states that *"The extent of ZTV required may need to be adjusted inwards or outwards according to the specific characteristics of a landscape and/or proposed development. The extent of the final ZTV should be discussed and agreed with the determining authority and consultees."* **Figure 8.2** shows a ZTV generated based on a layout of 149.9m turbine height. This is a comparative ZTV illustrating the theoretical visibility of the Consented Development (16 turbines @ 130m to blade tip) and the Variation Development (16 turbines @ 149.9m to blade tip). It should be noted that the ZTV does not account for the effect of screening provided by buildings and vegetation.

- 8.3.2 **Figure 8.2** shows that there is very limited visibility of the Variation Development between 35 and 40km and on this basis, these views are likely to be Not Significant at these distances. Therefore, the same study area of 35km used for the Consented Development is considered appropriate for the Variation Development.
- 8.3.3 The LVIA reported in the 2015 ES and 2017 FEI assessed significant effects on a number of landscape and visual receptors within approximately 7km of the turbines. As a precaution and following a similar approach to the previous LVIAs, the detailed study area is likely to focus on landscape receptors as follows:
- Landscape Character within 10km; and
  - Landscape Designations within 10km.
- 8.3.4 At a further distance and within the 35km study area, only those areas of landscape receptors which are designated at a national or international level, and are overlapped by the blade tip ZTV for the Variation Development, will be included in the assessment.
- 8.3.5 Visual Receptors will be assessed as follows:
- Settlements within 10km;
  - Residential Properties within 2km (a separate Residential Visual Amenity Assessment will be undertaken);
  - Transport Routes within 10km;
  - Core Paths, Scottish Hill Tracks and Heritage Paths within 10km;
  - Scotland's Great Trails and the National Cycle Network within 35km; and
  - Recreational and Tourist Destinations within 10km.
- 8.3.6 A review of the broad wind farm context within a 60km radius has been undertaken, based on the latest SNH mapping of large-scale wind farm development. It is considered that any cumulative effects that would occur would arise as a result of the pattern of development within the 35km study area radius rather than as a result of changes beyond this. A 35km study area is therefore proposed for the cumulative assessment.
- 8.3.7 A plan showing the locations of wind farms within the 35km study area that are operational, under construction, consented or which are at application stage and where the turbines are greater than 50m to blade tip is presented in **Figure 8.3**. Micro-generation turbines between 25-50m to blade tip within 10km of the Variation Development have been included.

## Landscape Character

- 8.3.8 The landscape character of the Development Site is described in the SNH National Landscape Character Assessment (NLCA), 2019 which covers the whole of Scotland and supersedes the 1990s

landscape character descriptions and mapping. The SNH website<sup>5</sup> advises that this data "should be used for new development proposals, plans and strategies, and so on. Where current proposals or projects have analysis based on the 1990s LCT dataset that should still be used. It should be noted which dataset has been used. Where there are topic-specific landscape capacity or sensitivity studies, they would take precedence for informing that development type, e.g. wind farms." It may be noted that the landscape character of the Development Site and surroundings within 10km are described in the East Ayrshire, and Dumfries and Galloway Wind Farm Landscape Capacity Studies and will therefore take precedence over the SNH NLCA 2019, as follows:

- Anderson, Carol Landscape Associates; East Ayrshire Landscape Wind Capacity Study, Main Study Report (2018); and
  - Anderson, Carol Landscape Associates; Dumfries and Galloway Wind Farm Landscape Capacity Studies (2017).
- 8.3.9 In particular, the assessment would consider the likely effects on the host landscape within which the Variation Development is located (East Ayrshire Southern Uplands LCT – Benty Cowan Hill LCA and Southern Uplands with Forestry LCT – Enoch Hill LCA) and other the LCTs within 10km. LCTs beyond 10km will be excluded from the assessment.

### Landscape Designations

- 8.3.10 There are no national or international landscape designations within the study area as illustrated in **Figure 8.4**. The Galloway Forest Dark Sky Park, and Gardens and Designed Landscapes will be assessed as Recreational and Tourist Receptors.
- 8.3.11 The following local landscape designations are located within 10km of the Development Site:
- Sensitive Landscape Character Areas (SLCA) (East Ayrshire), namely:
    - ▶ Afton SLCA; and
    - ▶ Doon Valley SLCA.
  - Galloway Hills Regional Scenic Area (Dumfries and Galloway).
- 8.3.12 Effects on the above local designations would be considered in the assessment.

### Wild Land

- 8.3.13 No part of the Development Site is located within a Wild Land Area (WLA), the nearest being Merrick WLA approximately 18km to the south-west.
- 8.3.14 The LVIA reported in the 2015 ES and 2017 FEI concluded that the introduction of the Proposed Development into the baseline landscape in which wind farm development already exists would not lead to a significant effect on the Merrick WLA or wild land characteristics and special qualities. This was due mainly to the large intervening distances and visual compatibility of the Proposed Development with other existing and consented wind farm development, including South Kyle, Windy Standard and Extension, Pencloe, Windy Rig and Benbrack, affecting a similar area and angle of view. This also applies to the Variation Development for the same reasons and considering the

<sup>5</sup> <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland>

very limited visibility from the WLA. Therefore, the need for a detailed Wild Land Assessment has been scoped out.

## Visual Receptors

- 8.3.15 The baseline of visual receptors (people) would draw upon the ZTV, site visits and viewpoint analysis and would include the following visual receptors:
- Views from settlements within 10km, including Burnside, Bankglen, Connel Park, Leggate, New Cumnock, Dalmellington and Burnton;
  - Views experienced whilst travelling through the landscape (road users, walkers, horse riders and cyclists, for example); and
  - Views from tourist and recreational destinations.
- 8.3.16 The visual assessment would consider the visual effects on transport routes including the A76, A713 and B741, and the Glasgow to Carlisle railway line near New Cumnock within 10km. Other minor roads also include Glen Afton Road, C36 road between Cumnock and New Cumnock, and the minor road between the B741 at Littlemark and Garallan Bridge on Skares Road (B7046).
- 8.3.17 National level recreational routes would include the Sustrans Cycle Route 7 and Southern Upland Way Long Distance Footpath. Other recreational routes are entirely outwith the blade tip ZTV and would therefore be excluded from the assessment.
- 8.3.18 Local recreational routes included within the assessment would be based on the Core Path Network sourced from the Council's Core Path Plan and known Rights of Way, and other local promoted walks.
- 8.3.19 Recreational and tourist destinations would include those features that appear as prominent landmarks or landscape features and locations associated with passive recreation such as walking and where there is a clear relationship between the feature / destination and the landscape. The key attractions within 10km of the Development Site include Craigengillan Garden and Designed Landscape (GDL), Burns Memorial, Knockshinnoch Lagoons local nature reserve, Galloway Forest Dark Sky Park and Loch Doon. The hill summits of Cairnsmore of Carsphairn, Blackcraig Hill and Windy Standard would also be included in the assessment.
- 8.3.20 A residential visual amenity assessment would be undertaken for individual or groups of residential properties within 2km from the outer proposed turbines.

## Visualisations

- 8.3.21 Visualisations and figures would be produced to SNH's standards as set out in '*Visual Representation of Wind Farms Guidance: Version 2.2*' (February 2017). These would include 90-degree baseline photographs from each representative viewpoint and accompanying wirelines showing the Variation Development and all other operational, under construction, consented and application stage cumulative wind farm developments. Wirelines and photomontages at 53.5° would also be included to show the Variation Development at a larger scale.

## Viewpoint Selection

- 8.3.22 The proposed viewpoints, shown in **Table 8.1** and on **Figure 8.2**, are drawn from the LVIA reported in the 2015 ES and 2017 FEI. A total of 12 viewpoints are proposed to be included in the

assessment – six of these locations were assessed as Significant (Substantial / Moderate) for the Consented Development, whilst the remaining six assessed as Not Significant (Moderate to Slight) are included in the assessment as a precaution.

8.3.23 A further 12 viewpoints (in red) are proposed to be scoped out as set out in the table below, with wirelines for these provided in **Figures 8.5a-f**. The agreement of East Ayrshire Council, and SNH is sought on the suggested viewpoints.

Table 8.1 Proposed Assessment Viewpoints

Viewpoint	Distance	Comments	Included / Scoped Out	Wireline / Photomontage
1. B741 North East of Dalmellington	2.3km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
2. B741 South West of New Cumnock	3.2km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
3. Core Path 667 Water of Deugh (Figure 8.5a)	4.5km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the current cumulative baseline, the Variation Development would be visible beyond the consented South Kyle Wind Farm and would be further screened by intervening forestry and landform. The effects of the Variation Development would therefore be the same as the Consented Development.	Proposed to be scoped out	N/A
4. New Cumnock Cemetery	5.9km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
5. Highpoint north of site (near Auchinross)	6.5km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
6. Blackcraig Hill	7.2km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
7. Lochside Hotel	7.2km	Assessed as Significant (Substantial / Moderate) in 2017 FEI	Included	Photomontage
8. Cairnsmore of Carsphairn	8.7km	Assessed as Not Significant (Moderate) in 2017 FEI. This viewpoint will be included as a precaution.	Included	Photomontage
9. Bogton Loch (Figure 8.5a)	9.5km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the current cumulative baseline, the Variation Development would be visible beyond the consented South Kyle Wind Farm and would be partially screened by intervening vegetation and landform. The effects of the Variation Development would therefore be the same as the Consented Development.	Proposed to be scoped out	N/A
10. Fort Carrick (Figure 8.5b)	9.6km	Very Limited visibility of the Variation Development (two blade tips) visible beyond the consented South Kyle Wind Farm blade tips.	Proposed to be scoped out	N/A
11. Auchenroy Hill	10.9km	Assessed as Not Significant (Moderate) in 2017 FEI. This viewpoint will be included as a precaution.	Included	Photomontage
12. Corsencon Hill	11.6km	Assessed as Not Significant (Moderate) in 2017 FEI. This viewpoint will be included as a precaution.	Included	Baseline Photo and Wireline

Viewpoint	Distance	Comments	Included / Scoped Out	Wireline / Photomontage
13. Loch Doon Shore (Figure 8.5b)	12.3km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the current cumulative baseline, the Variation Development would be visible beyond the consented South Kyle Wind Farm and would be further screened by forestry and landform. The effects of the Variation Development would therefore be the same as the Consented Development.	Proposed to be scoped out	N/A
14. A70 Between Cumnock and Prestwick (Figure 8.5c)	14.6km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the current cumulative baseline, the Variation Development would be visible beyond the consented Over Hill and application North Kyle Wind Farms and would be partially screened by forestry and landform. Considering the above and the distance, the effects of the Variation Development would be the same as the Consented Development.	Proposed to be scoped out	N/A
15. A76 North of Auchinleck	15.7km	Assessed as Not Significant (Slight to Slight / Negligible) in 2017 FEI. This viewpoint will be included as a precaution considering its direction to the Variation Development and without any other wind farms in front of it.	Included	Baseline Photo and Wireline
16. A70 NE of Cumnock (Figure 8.5c)	17.5km	There would be No View of the Variation Development. Whilst the wireline indicates theoretical visibility of the turbines, the quarry mounds in the middle distance (not on the wireline) would completely screen the Variation Development.	Proposed to be scoped out	N/A
17. A76 Mauchline (Figure 8.5d)	19.6km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the current cumulative baseline and long distance, the effects of the Variation Development would be the same as the Consented Development.	Proposed to be scoped out	N/A
18. Shalloch on Minnoch (Figure 8.5d)	22.1km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the long distance and current cumulative baseline, the Variation Development would be in the same field of view as other wind farm development and visible beyond the consented Benbrack and South Kyle Wind Farms. The effects of the Variation Development would therefore be the same as the Consented Development.	Proposed to be scoped out	N/A
19. Meikle Millyea (Figure 8.5e)	23.7km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the long distance and current cumulative baseline, the Variation Development would be in the same field of view as other wind farm development and visible beyond the consented Benbrack and South Kyle Wind Farms. The effects of the Variation Development would be the same as the Consented Development.	Proposed to be scoped out	N/A
20. Kirriereoch Hill (Figure 8.5e)	23.9km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the long distance and current cumulative baseline, the Variation Development would be in the same field of view as other wind farm development and visible beyond the consented Benbrack and South Kyle Wind Farms. The effects of the Variation Development would be the same as the Consented Development.	Proposed to be scoped out	N/A
21. Merrick (Figure 8.5f)	24.7km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the long distance and current cumulative baseline, the Variation Development would be in the same field of view as other wind farm development and visible beyond the	Proposed to be scoped out	N/A

Viewpoint	Distance	Comments	Included / Scoped Out	Wireline / Photomontage
		consented Benbrack and South Kyle Wind Farms. The effects of the Variation Development would be the same as the Consented Development.		
22. East Mount Lowther (Figure 8.5f)	29.8km	Assessed as Not Significant (Slight) in 2017 FEI. Considering the long distance and current cumulative baseline, the Variation Development would be in the same field of view as other wind farm development and visible beyond the existing Sanquhar, Whiteside Hill, Hare Hill and Windy Standard, and consented Sandy Knowe and Pencloe Wind Farms. The effects of the Variation Development would be the same as the Consented Development.	Proposed to be scoped out	N/A
A. Drumbrochan Road, Cumnock	12.2km	Assessed as Not Significant (Slight) in 2017 FEI. This viewpoint will be included as a precaution considering its direction to the Variation Development and without any other wind farms in front of it.	Included	Photomontage
B. Little Garclaugh, Upper Nith Valley	10.2km	Assessed as Not Significant (Moderate to Slight) in 2017 FEI. This viewpoint will be included as a precaution.	Included	Photomontage

## 8.4 Potential Landscape and Visual Effects

- 8.4.1 The landscape and visual assessment would focus on the assessment of the potential effects of the proposed variations to the Consented Development on landscape character and visual receptors around the study area.
- 8.4.2 The assessment would be carried out using a methodology that accords with 'GLVIA3' and has been specifically devised by Wood for the landscape and visual assessment of wind farms. The potential effects of the Variation Development on the landscape and visual resource are grouped into four categories: direct (physical) effects, effects on landscape character, effects on views, and cumulative effects.

### Landscape Effects

- 8.4.3 The Landscape Institute note that *"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed Development may influence in a significant manner."* The landscape effects occurring during the construction, decommissioning and operational phases of the Proposed Development may potentially include the following:
- Changes to landscape elements: the addition of new elements (wind turbines) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements of the landscape character type;



- Changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of landscape character types or contribute to the landscape value;
  - Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and
  - Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.
- 8.4.4 Development may have a direct (physical) effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and associated landscape character.

### Visual Effects

- 8.4.5 Visual effects are identified for different receptors (people) who will experience the view at their place of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:
- a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
  - the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

### Sequential Assessment

- 8.4.6 Cumulative sequential assessments of the Variation Development would be undertaken for the B741 and A76.

### Cumulative Landscape and Visual Effects

- 8.4.7 The CLVIA would be conducted in accordance with SNH Guidance and would take account of the cumulative landscape and visual effects likely to result from other existing, consented and proposed (planning application submitted) wind energy developments in addition to the Variation Development. It will focus on wind energy developments considered to have potential to give rise to significant cumulative effects. This is likely to be those wind farms within 35km of the Variation Development but will be subject to more detailed consideration. Turbines under 50m to tip beyond 10km from the Proposed Development will not be included.
- 8.4.8 The current cumulative situation is indicated in **Table 8.2** and illustrated in **Figures 8.2 and 8.3**. We anticipate that East Ayrshire Council will agree to this list in its response to consultation on the Scoping Report and advise on any further developments that it is aware of in the planning system.
- 8.4.9 Wind energy developments which may be at the scoping stages are likely to be excluded from further assessment on the basis that sufficient detail (on location and size of turbines) is seldom available to allow meaningful assessment. GLVIA3 (paragraph 7.14) states that developments at the scoping stage are generally not assessed unless there is a specific reason to include them. It should

also be noted that the details of development proposals often change between scoping and the submission of an application.

Table 8.2 Wind Farms within 35km of the Radius of the Site

Reference	Name of wind farm	Number of turbines	Distance from Variation Development (km)	Height to blade tip (m)	Status* (as of 25 November 2019)
E01	Windy Standard Extension	30	2.4km	120	Existing
E02	Afton	27	4.3km	100/120	Existing
E03	Windy Standard	36	4.9km	52	Existing
E04	High Park Farm	1	6.3km	75	Existing
E05	Hare Hill	20	7.1km	63.5	Existing
E06	Hare Hill Extension	35	8km	70/75/81/86/91	Existing
E07	Mansfield Mains	1	8.9km	44.85	Existing
E08	Sanquhar	9	11.1km	130	Existing
E09	Dersalloch	23	12.7km	125	Existing
E10	Whiteside Hill	10	13.6km	121.2	Existing
E11	Wether Hill	14	17.1km	91	Existing
E12	Sunnyside	2	19.6km	62	Existing
E13	Bankend Rig	11	26.2km	76	Existing
E14	Blackcraig	23	26.2km	110	Existing
E15	Hadyard Hill	52	27.3km	100	Existing
E16	Galawhistle	22	28.6km	110.2	Existing
E17	Dungavel	14	29.4km	100/120	Existing
E18	Hagshaw Hill Extension	20	30.3km	80	Existing
E19	Hagshaw Hill	26	30.8km	55	Existing
E20	Andershaw	14	31.2km	125	Existing
E21	Nutberry	6	31.4km	125	Existing
E22	Low Bowhill	1	31.5km	67	Existing
E23	Middle Muir	15	31.6km	136/152	Existing
E24	North Threave Farm	1	32.1km	53.7	Existing
E25	West Dykes	1	32.1km	77	Existing

Reference	Name of wind farm	Number of turbines	Distance from Variation Development (km)	Height to blade tip (m)	Status* (as of 25 November 2019)
E26	Whitelee Extension 2	39	32.4km	140	Existing
E27	Calder Water	13	32.7km	144.5	Existing
E28	Kype Muir	26	32.8km	132	Existing
E29	Hazelside Farm (T1)	1	32.8km	74	Existing
E30	Auchrobert	12	33.6km	132	Existing
E31	Whitelee Extension 1	36	34.1km	135	Existing
E32	West Browncastle	12	34.2km	126.5	Existing
E33	Whitelee	144	34.4km	110	Existing
E34	Low Waterhead	1	34.6km	67	Existing
E35	Tralorg	8	34.9km	100	Existing
C01	South Kyle	50	0.2km	149.5	Consented
C02	Pencloe	19	1.9km	149.9	Consented
C03	Benbrack	18	4.9km	132/135/149.9	Consented
C04	Over Hill	10	5.1km	149.9	Consented
C05	Windy Rig	12	7.6km	125	Consented
C06	Taiglim Farm	1	8.4km	33.6	Consented
C07	Polquhairn	9	10.1km	100	Consented
C08	Sandy Knowe	24	11.1km	125	Consented
C09	Lorg	9	12.3km	130/149.5	Consented
C10	Lethans	22	12.5km	136/152/176	Consented
C11	Knockshinnoch	2	13.3km	126.5	Consented
C12	Glenmuckloch	8	13.9km	133.5	Consented
C13	Torrs Hill	2	17.5km	100	Consented
C14	Penbreck	9	19.8km	125	Consented
C15	Glenshimmeroch	10	19.9km	149.9	Consented
C16	Twentyshilling Hill	9	20.8km	125	Consented
C17	NHS Ailsa Hospital	1	22.6km	78	Consented
C18	Kennoxhead	19	23.4km	145	Consented

Reference	Name of wind farm	Number of turbines	Distance from Variation Development (km)	Height to blade tip (m)	Status* (as of 25 November 2019)
C19	Linburn Farm	2	24.4km	67	Consented
C20	Knockman Hill	5	24.6km	81	Consented
C21	Bankend Rig Extension	3	26.1km	126.5	Consented
C22	Kirk Hill	8	29.1km	110	Consented
C23	Cumberhead	11	29.2km	126.5	Consented
C24	Stoneyhill Farm	1	30.1km	100	Consented
C25	Kype Muir Extension	15	30.5km	156/176/200/220	Consented
C26	Chapelton Farm	3	31.2km	67	Consented
C27	Penwhapple Reservoir	1	32.1km	67	Consented
C28	Mount Farm	1	32.5km	129.8	Consented
C29	Dalquhandy	15	32.6km	131	Consented
C30	Hazelside Farm (T2)	1	32.9km	74	Consented
C31	Douglas West	13	33.5km	149.9	Consented
C32	Sneddon Law	15	33.5km	130	Consented
C33	Hallburn Farm	1	33.6km	67	Consented
C34	Mochrum Fell	8	33.9km	116.5/126.5	Consented
C35	Cleughhead Farm	1	34.5km	79	Consented
C36	High Waterhead	1	34.7km	67	Consented
A01	Windy Standard Phase III	20	3.3km	125/177.5	Application
A02	North Kyle	54	3.8km	149.9	Application
A03	Sanquhar II	50	6.2km	200 / 149	Application
A04	Shepherd's Rig	19	11.9km	149.9/125	Application
A05	Troston Loch	14	19.9km	149.9	Application
A06	North Lowther	35	24.4km	150	Application
A07	Glentaggart	5	31.5km	132	Application
A08	Douglas West Extension	13	31.8km	200	Application
A09	Feoch	1	31.9km	67	Application

## 8.5 Night-time Lighting

- 8.5.1 As all turbines would be below 150m to blade tip, no aviation lighting will be required, and therefore a night time lighting assessment is scoped out.

## 8.6 Significance of Effects

- 8.6.1 The broad objective in assessing the effects of the Variation Development is to determine what effects on the landscape and visual resource will be significant. The significance of effects will be assessed through a combination of two considerations; (i) the sensitivity of the landscape element, landscape character receptor, view or visual receptor, and (ii) the magnitude of change that would result from the introduction of the Variation Development:
- **Sensitivity** is an expression of the ability of a landscape element, landscape character receptor, view or visual receptor to accommodate the Variation Development, and is dependent on baseline characteristics including susceptibility to change, value, quality, importance, the nature of the viewer, and existing character.
  - **Magnitude of change** is an expression of the scale of the change on landscape elements, landscape character receptors and visual receptors that would result from the Variation Development.
- 8.6.2 The factors that are considered in the sensitivity and magnitude of change considerations are assimilated to assess whether the Variation Development would have an effect that is significant or not significant. In accordance with GLVIA3 (paragraph 3.23), experienced professional judgement is applied to the assessment of all effects and the rationale supporting each conclusion is presented.
- 8.6.3 A significant effect occurs where the proposed changes to the Consented Development would provide a defining influence on a landscape element, landscape character receptor or view beyond that already assessed in the 2015 ES and 2017 FEI. A significant cumulative effect occurs where the combined effect of the Variation Development with other existing and proposed wind farms would result in a landscape character or view being characterised primarily by wind farms.

### Nature of Effects

- 8.6.4 The EIA Regulations state that the EIA Report should include a description of the likely significant effects of the Variation Development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short and long-term, permanent and reversible, positive and negative effects of the Variation Development. Guidance provided by the Landscape Institute on the 'Nature of Effect', in the GLVIA3, is limited to a single entry which states that *"One of the more challenging issues is deciding whether the landscape (or visual) effects should be categorised as positive or negative. It is also possible for effects to be neutral in their consequences for the landscape. An informed professional judgement should be made about this and the criteria used in reaching the judgement should be clearly stated."*
- 8.6.5 In relation to many forms of development, the LVIA would identify 'positive', 'neutral' and 'negative' effects by assessing these under the term 'Nature of Effect'. In respect of landscape and visual effects of wind farms however, there are no definitive criteria by which these can be measured as being categorically 'positive' or 'negative'. In some disciplines, such as noise or ecology, it is possible to quantify the effect of a wind farm in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected by a proposed development and assessing

the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

## 9. Historic Environment

- 9.1.1 As part of the EIA for the Consented Development, the impact on the historic environment was assessed and this considered direct effects on heritage assets as well as visual effects on off-site heritage assets in respect of the 'setting' in which they are appreciated and understood.
- 9.1.2 It is considered that for the Variation Development, direct effects on the Historic Environment can be scoped out as these would not change from the Consented Development, for which no significant residual adverse effect was anticipated; no change to the footprint of the development is proposed and a programme of archaeological works and agreed scheme of archaeological mitigation would be applied for the Variation Development in the same way as for the Consented Development.
- 9.1.3 There are designated heritage assets and non-designated heritage assets of potentially regional or national importance within the wider area, including listed buildings, scheduled monuments and garden and designed landscapes and these were considered in terms of the potential for visual impacts upon their setting. Non designated assets assessed in detail included: Craigengillan garden and designed landscape, Dumfries House garden and designed landscape, Beoch Cairn and Fardenreoch prehistoric Cairns. The indirect visual effects of the Variation Development on designated heritage assets within the wider area were all assessed as being not significant as reported in the 2015 ES.
- 9.1.4 For indirect effects, the increase of turbine rotor diameter and blade tip height would generally present a minor change in the appearance of the Variation Development, although is in not anticipated that this would discernibly affect understanding or experience of the assets, and would therefore not present any increase in the magnitude of change to setting from the consented layout in all cases with the exception of Craigengillan, which is addressed below. The assets which may be more susceptible, or where the increase in height to blade tip may produce a greater effect on setting comprise:
- Craigengillan Garden and Designed Landscape and associated listed buildings.
- 9.1.5 In the case of the setting of Craigengillan Garden and Designated Landscape, the Consented Development lies 7.7km from the asset. As reported in the 2015 ES and 2017 FEI that there would be visibility of the turbines from different parts of the landscape to varying degrees. The turbines appear as distant features and there is a further sense of separation provided by the higher land in the foreground which screens the lower portion of the turbines. Existing vegetation around Craigengillan also means that distant views are filtered as the visitor moves around the landscape. The assessment concluded that the prevailing planting scheme and underlying topography meant visibility of the Consented Development from the more sensitive and important areas would be largely screened, and the turbines would only appear in passing or sequential views as the viewer moved through the landscape, and would appear as a background element.
- 9.1.6 An increase in turbine height to 149.9m would likely increase the number of locations where the Variation Development would be visible. As the viewer moves around the general landscape, blade tips may intermittently appear above planting or above other elements of the group of assets where currently they would be hidden. However, the views from the house would remain oblique and largely precluded by planting, while views from other parts of the Garden and Designed Landscape which are deemed important for their scenic/work of art value would not have visibility of the turbines. Overall, this would result in minimal increased intrusion, and where visible, the

Variation Development would still appear as a distant (7.7km) element of the background, rather than an intrusive foreground element, and would not affect the ability to understand and appreciate the core values of the asset. An increase in turbine height would not increase the magnitude of change above low as concluded in the 2015 ES and 2017 FEI, and no significant effect is anticipated. It is therefore proposed to scope Craigengillan Garden and Designed Landscape and associated listed buildings out of the assessment.

9.1.7 In conclusion, it is not considered that the additional effects caused by the Variation Development are likely to be significant and it is therefore proposed that a historic environment assessment is scoped out.



## 10. Ecology

### Introduction

- 10.1.1 The results of the ecological impact assessment (EcIA) for the Consented Development are presented in the 2015 ES and 2017 FEI. The scope of the EcIA was determined through a review of existing biological data relating to the Development Site and the surrounding area, together with consultations with relevant nature conservation organisations such as SNH. Ecological surveys undertaken included detailed protected species surveys (for badger, otter, water vole and bats), as well as a vegetation survey to identify plant communities of higher nature conservation value and/or those that may be sustained by groundwater (Groundwater Dependent Terrestrial Ecosystems – GWDTEs). In addition, a fisheries habitat survey, electrofishing surveys and a targeted survey for freshwater pearl mussels were also undertaken.
- 10.1.2 The Development Site is dominated by dry modified bog, wet modified bog and marshy grassland, all of which are affected by sheep grazing and man-made drainage which have degraded the conservation value of the habitats present. No significant effects were predicted on any plant communities of high nature conservation value. Furthermore, no significant effects on any statutory designated sites were predicted to occur.
- 10.1.3 The presence of otter, water vole, a number of freshwater fish (salmon, trout, stone loach, minnow and lamprey) and at least five bat species (soprano pipistrelle, common pipistrelle, brown long-eared bat, Nyctalus species and Myotis species) was confirmed during surveys. No significant effects were predicted on any species of high nature conservation value or any legally protected species.
- 10.1.4 Three schemes at application stage which have subsequently been consented (South Kyle, Pencloe and Benbrack) were included in the cumulative impact assessment, which concluded that there would be no significant cumulative effects on ecological receptors.
- 10.1.5 Since the variation to the Consented Development primarily relates to increasing rotor diameter and the blade tip height of turbines, with the environmental baseline, all ground level infrastructure, construction/decommissioning methods and programme etc. remaining unchanged, the only receptors scoped into the assessment for the Variation Development are bats as there may be an increased risk of direct mortality through collisions with fast-moving turbine blades or barotrauma (i.e. internal haemorrhaging in the lungs resulting from rapid changes in air pressure behind moving turbine blades). This increase in risk is primarily as a result of the increased rotor diameter which increases the area of airspace swept by rotating blades. Effects on all other ecological receptors would be predicted to remain non-significant and unchanged from the 2015 ES and 2017 FEI and thus are proposed to be excluded from the EIA.

### Baseline Conditions

#### Consultation

- 10.1.6 Consultation would be undertaken with South West Scotland Environmental Information Centre (SWSEIC) to update local baseline information pertaining to bats. Relevant publications released since the 2015 ES and 2017 FEI will also be reviewed for relevant local bat data.

## Field Studies and Assessment

- 10.1.7 As the habitats and management of the Development Site and surrounding area remain unchanged (as noted during site visits), roosting, commuting or foraging habitat will remain largely unchanged since the bat surveys carried out to inform the 2015 ES and 2017 FEI. Therefore, the Variation Development EIA would utilise any information obtained from consultation with SWSEIC and the baseline information contained in the 2015 ES and 2017 FEI, summarised as follows:
- Due to the presence of a known bat hibernaculum at Craigdullyear limestone mine east of New Cumnock (approximately 10km east north east of the Development Site), static monitoring surveys were undertaken at ten locations across the Development Site and at four locations at the mine entrances in October and November 2012, in order to investigate the importance of the Enoch Hill site to bats during autumn migration;
  - To investigate the use of the bat study area by commuting and foraging bats, three pre-determined transect routes of approximately equal length were walked at night once in each of spring, summer and autumn 2013;
  - Static detector surveys at ground level were undertaken seasonally over five consecutive nights at seven different locations across the Development Site in 2013;
  - Daytime roost assessment surveys were undertaken in four areas adjacent to the Development Site in 2014; and
  - Two meteorological masts (met masts) on the Development Site were fitted with static detectors and data collected between July and December 2014, with additional data collected at ground level at control sites outwith the Development Site during September 2014.
- 10.1.8 Bats from the genera *Pipistrellus*, *Myotis*, *Plecotus* and *Nyctalus* were identified throughout the study area, though the overall activity levels were generally low.
- 10.1.9 No bat roosts were identified during the surveys in 2012 or 2013 and no suitable roosting habitat was identified on the Development Site. During 2014, individual trees in woodland areas adjacent to the Development Site were assessed as being suitable to support roosting bats and a pipistrelle bat roost was recorded off-site at Marshallmark. Anecdotal reports of bats roosting in a house at Dalleagles Terrace were also noted.
- 10.1.10 Static detector surveys in autumn 2013 recorded four bat passes in October only, comprising a single common pipistrelle and three *Myotis* species passes, with no indication that the Development Site is an important strategic location for bats travelling to hibernation or swarming sites. Monitoring at Craigdullyear Mine recorded 316 bat passes over 17 nights, comprising five species (Daubenton's bat, Natterer's bat, brown long-eared bat, common pipistrelle and soprano pipistrelle), with activity levels and timings confirming the site's use for swarming by *Myotis* species.
- 10.1.11 Transect surveys in 2013 recorded very low levels of common and soprano pipistrelle activity only. Static detector surveys at ground level in 2013 recorded a total of 1,372 bat calls, 91.3% of which were recorded during the summer monitoring period, with low levels of activity recorded in spring and autumn. Bat species recorded comprised Leisler's bat, *Nyctalus* species, soprano pipistrelle, common pipistrelle and *Myotis* species. The majority of activity (778 passes) was recorded at the lowest altitude monitoring location, with 584 of these being Leisler's bat passes and a further 15 being *Nyctalus* passes (considered likely to be Leisler's bat). Leisler's bat specialises in foraging in open habitats and shows preference for cattle-grazed pasture farmland, which is found in lower regions of the Development Site and was recorded at all static detector locations. The pattern of activity indicates a small number of individuals, which roost off-site, travel to the Development Site

to forage, particularly in summer. It should be noted that hunting grounds of this species are reported as covering 7.4-18.4km<sup>2</sup>, and that the detectors deployed covered a collective area of 3km<sup>2</sup>, and it is possible that the detectors were recording passes by the same bat. As such, the potential risk to population of this species from collision with turbines was considered lower than is implied by the 2013 data.

- 10.1.12 Common pipistrelle, soprano pipistrelle, Leisler's bat and Daubenton's bat were recorded at the met masts in 2014, with a total of 255 bat passes recorded. 96 of these were recorded "at height". Bat activity was dominated by pipistrelle species, with 3.1% being attributed to Leisler's bat and 2.7% being attributed to *Nyctalus* species. Bat activity at the ground level control sites was found to be higher than at the met masts, with brown long-eared bat also recorded at control sites.
- 10.1.13 Overall, the survey results indicated that low numbers of 'low risk'<sup>6</sup> bat species and a low number of 'high risk' bat species occur at the Development Site.
- 10.1.14 Taking into account this comprehensive survey effort identifying a low level of bat activity, coupled with the location of infrastructure of the Consented Development and the environmental baseline being unchanged for the Variation Development, no further survey effort is proposed to inform the EIA. Basing the EIA on previously gathered data also allows the difference between the collision risk associated with the Consented Development and the Variation Development to be assessed.

## Methodology for Establishment of Effects and Reporting

- 10.1.15 The evaluation methodology will take account of best practice guidance (CIEEM, 2018)<sup>7</sup> and the assessment of the significance of predicted effects on ecological receptors (bats) will be based on the 'value' or 'sensitivity' of the receptor and the predicted magnitude of change resulting from the proposed increase in rotor diameter and blade tip height.
- 10.1.16 An Ecology chapter would be produced that would summarise the findings of the updated desk study and the surveys reported in the 2015 ES and 2017 FEI. These would form the baseline against which the potential impact of the variation to the Consented Development on bats would be assessed, based on both ecological importance and the nature and magnitude of the impact that the Variation Development would have. Recommendations would be made for mitigation where considered necessary. Cumulative impacts will also be assessed.

<sup>6</sup> 'Risk' related to risk of collision with turbine blades, as defined by the Bat Conservation Trust.

<sup>7</sup> Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1 (Chartered Institute of Ecology and Environmental Management [CIEEM], 2018)



# 11. Ornithology

## 11.1 Introduction

- 11.1.1 The 2015 ES and 2017 FEI both concluded that the Development Site was of low sensitivity for ornithological receptors and that there would be no significant effects as a result of the Consented Development.
- 11.1.2 SNH provided consultation on the 2017 FEI, broadly agreeing with the ornithology assessment (no significant effects predicted) and stating that all mitigation proposed should be fully implemented. RSPB responded to the 2017 FEI and considered the Consented Development to have the potential to negatively impact on non-breeding populations of golden plover as well as black grouse and they requested the inclusion of habitat enhancement work for both species as part of an agreed Habitat Management Plan (the details of which would be agreed with the planning authority in consultation with SNH and SEPA prior to construction as per the planning conditions of the Consented Development) and also a programme of post-construction bird monitoring.
- 11.1.3 Since the variation to the Consented Development is limited to increasing rotor diameter and the blade tip height of turbines, with the environmental baseline, all ground level infrastructure, construction / decommissioning methods and programme etc. remaining unchanged, the only aspect scoped into the assessment is the risk of birds colliding with turbine blades. Effects in relation to all other ornithological aspects, for example loss of foraging/nesting habitat, would be predicted to remain non-significant and unchanged from the 2015 ES and are thus would be excluded from the EIA.
- 11.1.4 The risk of collision mortality on birds may increase, primarily as a result of the increased rotor diameter which increases the area of airspace swept by rotating blades. Given the low levels of target species flight activity recorded at the Development Site during baseline surveys, it is considered that any change in impact magnitude arising from the variation element will be minor. However, it is proposed that collision risk is re-assessed and the previous collision risk modelling will therefore be updated to assess the change in risk as a result of increasing the size of turbines and the increase in operational period from 25 to 30 years.
- 11.1.5 Collision risk modelling presented in the 2015 ES and 2017 FEI was limited to golden plover only given the presence of relatively small groups of birds during the winter period that were recorded in flight within the area proposed for turbines. As site visits in the intervening period have confirmed that habitats and land management remain largely unchanged, as does the bird community with golden plover continuing to occur during the winter period, the collision risk assessment for the Variation Development will also consider this species only.

## 11.2 Baseline Conditions

- 11.2.1 A literature search and review were carried out for the 2015 ES in order to gain an insight into the ecology and behaviour of key species that could be affected by the now Consented Development. The RSPB and the South Strathclyde Raptor Study Group (RSG) were contacted to request the provision of data relating to black grouse records within 1.5km of the core survey area as well as protected raptors and other species of designated conservation concern within 2km (including eagles within 6km). The RSPB provided multiple black grouse records clustered to the north, west and east of the turbine locations, between 2006 and 2011, all of which related to single displaying

- males. Records of barn owl and nightjar present to the north and west of the Consented Development were also indicated by the data search. The RSG confirmed four barn owl breeding sites from within the search area, with a further three nest sites were also identified as being present close to the search areas, as well as two nest sites of peregrine.
- 11.2.2 A survey programme was also carried out, inclusive of the breeding and non-breeding bird seasons, between September 2011 and March 2014. This included vantage point watches, with low levels of flight activity by target species except for golden plover, which had moderate levels of flight activity in winter. Breeding raptor surveys were undertaken in 2013, with a single Schedule 1 / Annex I species breeding within the search area (merlin); and breeding barn owl surveys were undertaken in 2012 with a single pair breeding within the search area. Breeding wader / moorland breeding bird surveys were carried out in 2012 and 2013 with low densities of breeding waders recorded (three curlew territories recorded in 2013). Black grouse lek surveys were undertaken in 2012 and 2013 with a single lek site identified within the Development Site, comprising a peak count of three males and two females, with a further three satellite leks within 1km of the main lek location. Winter transect surveys, carried out in 2011/12 and 2012/13 recorded very low utilisation of the Development Site by target species with golden plover and black grouse recorded.
- 11.2.3 The 2015 ES also considered all Natura 2000 sites along with any Sites of Special Scientific Interest (SSSIs) with ornithological interests within a 20km search radius of the Development Site. One Special Protection Area (SPA) and three SSSIs were identified, as follows:
- Muirkirk and North Lowther Uplands SPA (approximately 11km from Development Site);
  - Merrick Kells SSSI (approximately 16km from Development Site);
  - North Lowther Uplands SSSI (approximately 7km from Development Site); and
  - Bogton Loch SSSI (approximately 8,5km from Development Site).
- 11.2.4 No connectivity was identified between the qualifying / cited features of the designated sites and the now Consented Development as detailed within the 2015 ES. Given that potential impacts on birds arising from the changes under the Variation Development are likely to be very minor, it is considered that it will not be necessary to carry out Habitats Regulations Appraisal (HRA) screening.

### 11.3 Methodology for Establishment of Effects and Reporting

- 11.3.1 The evaluation methodology will take account of best practice guidance (CIEEM, 2018). The assessment of the significance of predicted effects on ornithological receptors will be based on the 'value' or 'sensitivity' of a receptor (golden plover in this case) and the predicted magnitude of change resulting from the proposed increase in rotor diameter and blade tip height. In the event that there is a predicted increase in collision risk that would be of sufficient magnitude to materially contribute to in-combination effects, a cumulative impact assessment will be undertaken. This will be carried out assessing other wind farm proposals/schemes within a 10km radius of the Development Site, in order to be comparable with the 2015 ES and 2017 ES (as opposed to the current SNH (2018) guidance which requires assessments at the Natural Heritage Zone level).
- 11.3.2 An EIA Report chapter would be produced which would focus of collision risk for golden plover and recommendations would be made for mitigation where considered necessary.







## 12. Geology, Hydrology and Hydrogeology

- 12.1.1 The assessment reported in the 2015 ES and 2017 FEI highlighted the potential for effects on the geology, hydrology and hydrogeology of the Development Site, primarily during wind farm construction, but potentially also during site operation and decommissioning. These effects are associated with a range of activities, most notably access track construction.
- 12.1.2 For the proposed variation, the turbines are at the same locations as consented, i.e. only an increase in rotor diameter and height is proposed, and all other infrastructure remains as assessed previously. As such, and as a result of the unchanged environmental baseline, the conclusions presented in the 2015 ES and 2017 FEI remain valid. Therefore, based on the provision of all mitigation measures covered within the 2017 FEI the conclusions regarding the residual effects of the Variation Development would remain the same as for the Consented Development – i.e. not significant.
- 12.1.3 As stated within the 2017 FEI report, although two turbines (T2 and T5) lie within the precautionary 100 m buffer originally assigned across the whole of the River Nith catchment, the improved baseline fisheries knowledge for the nearby watercourses (Catloch Burn and LittleChang Burn) demonstrated that they are of lower sensitivity due to the lack of salmonid habitat. Whilst downstream watercourses do contain salmonid populations, the measures that will be put in place provide an appropriate level of protection alongside a 50 m buffer.
- 12.1.4 On this basis, the moderate level of change with respect to water quality was reduced to low, leading to a moderate level of residual effect which is 'not significant'. Residual effects for all relevant receptors during all phases of the Variation Development are therefore concluded to be not significant.
- 12.1.5 In addition, although there is an inherent risk of sediment loading and pollution occurring on all construction sites, the implementation of the mitigation measures, along with compliance with Controlled Activity Regulations (CAR) licensing requirements, reduces the residual magnitude of any potential impact to negligible or low. This has been shown within previous assessments to result in a residual level of effect that is negligible and not significant for all water environment interests.
- 12.1.6 In summary, as the proposed changes relate to above ground infrastructure only and all the mitigation measures previously defined for each element of the on-site development will be implemented (most of which involve work being undertaken in accordance with current best practice), it is concluded that there would be no significant effects on geological, hydrological or hydrogeological receptors as a result of the Variation Development. It is therefore proposed to scope out the assessment of receptors related to geology, hydrology and hydrogeology from the Variation Development EIA.



## 13. Traffic and Transport

### 13.1 Introduction

- 13.1.1 All components of the Variation Development will be transported to the site by road, which creates the potential for traffic and transport related environmental effects on the trunk and local road network. The assessments presented in the 2015 ES and 2017 FEI highlighted traffic and transport related effects as a result of the Consented Development, primarily during wind farm construction, but potentially also during site operation and decommissioning, and concluded that effects would not be significant.
- 13.1.2 Under the proposed variation to the Consented Development, blade length and the height of all 16 turbine towers would increase, though all other infrastructure elements, and hence traffic movements, would remain the same. As effects relating to construction/operation/decommissioning would therefore remain not significant, the only change as a result of the proposed variation to the Consented Development that requires additional assessment relates to Abnormal Indivisible Loads (AIL).

### Proposed Scope of Work - Abnormal Indivisible Loads (AIL)

- 13.1.3 The proposed variation to the Consented Development relates to the increase in the size of turbine components and the previous Swept Path Analysis (SPA) will therefore be revisited (Appendix 14.A of the 2017 FEI) and updated based on the revised turbine and blade specification and presented in the EIA Report. It is proposed that all other traffic and transport related environmental effects are scoped out of the assessment as all other infrastructure elements remain unchanged and the 2017 FEI therefore remains valid.
- 13.1.4 The route used to deliver turbine components from Ayr Port is expected to remain unchanged. AILs are expected to depart from the Jura Terminal along Waggon Road, before turning on right on Allison Street (A79). From here the access route would follow the A719, A77, A76 and the B741, entering the Development Site at a new junction off the B741 in the north-western part of the Development Site.
- 13.1.5 SPAs illustrating the transportation of the larger turbine blades will be undertaken at the following relevant locations from the access study that informed the 2015 ES and FEI and presented in the EIA Report:
- Left bend on the B741 at Connel Burn (OS Grid ref: NS 60815 12820);
  - Left bend on the B741 at Manse War Memorial (OS Grid ref: NS 60059 12544);
  - Right bend on B741 at Farm (OS Grid ref: NS 58007 10673);
  - B417 Dalleagles Bridge (OS Grid ref: NS 57365 10656);
  - Right bend on B741 (OS Grid ref: NS 56067 10502);
  - Left bend on B741 (OS Grid ref: NS 54706 10303); and
  - Proposed site access to Enoch Hill Wind Farm (OS Grid ref: NS 54411 09835).



## 14. Socio-economics

- 14.1.1 Wind farms have the potential to have both beneficial and negative effects on socio-economics, tourism and recreation. The 2015 ES and 2017 FEI did not identify any significant effects for socio-economics, tourism and recreation as a result of the Consented Development.
- 14.1.2 This scoping report chapter identifies the potential for significant effects as a result of the Variation Development, considering the receptors as considered in the 2015 ES and 2017 FEI.

### Economic & Employment

- 14.1.3 It is anticipated that the Variation Development would result in a similar positive effect in terms of direct capital expenditure and employment opportunities during the construction phase to that of the Consented Development. Overall, it is considered likely that the economic and employment effects which are predicted to occur through the Variation Development would result in a not significant effect similar to that of the Consented Development and this is therefore scoped out of further assessment.

### Public Access and Recreation on-site

- 14.1.4 The Variation Development does not propose any changes to the layout of the Consented Development. Land use and access to the Development Site has not changed and so the public access impact of the Variation Development would be very similar in scale and nature to those of the Consented Development. Therefore, it is considered that the Variation Development would result in the same level of effects in respect of the access available across the Development Site, which is considered to be not significant. It is therefore proposed that on-site recreation and public access are therefore are scoped out of the assessment.

### Tourism and Recreation

- 14.1.5 The previous assessment concluded that landscape and visual effects would not change tourist activity to a degree that significant effects in respect of visitor numbers or visitor spending would occur.

An updated assessment of the landscape and visual effects of the Variation Development will be undertaken (see **Chapter 8, Landscape and Visual** for further details). If the conclusions of the landscape and visual chapter suggest that the proposed variation to the Consented Development would result in a significant increase in the magnitude of change experienced by tourism and recreation receptors, further socio-economic assessment relating to these receptors will be undertaken.

## 15. Infrastructure and Other Issues

### 15.1 Introduction

- 15.1.1 Specific Advice Sheet Onshore Wind Turbines (Scottish Government, May 2014) identifies that wind turbines might impact on infrastructure, telecommunications, utilities and air safeguarding issues. Effects may, for example, include disruption of microwave rebroadcast links or local radio communication systems. The quality of television reception may also be affected, though to a lesser extent than prior to the switchover to digital transmissions, and viewers may suffer reduction of picture quality and acoustic interference.

### 15.2 Existing Infrastructure, Telecommunications and Broadcast Services

- 15.2.1 A range of investigations would be undertaken to establish the presence of existing infrastructure associated with utilities such as water, gas, electricity and telecommunications links to establish either the absence of effects or to identify appropriate mitigation to overcome any effects. These matters would be addressed through consultation with the relevant system operators to see if anything has changed in respect of this infrastructure since the 2015 ES and 2017 FEI were produced.

### 15.3 Population and Human Health

- 15.3.1 The potential effects on population and human health arising from the Variation Development would be considered in the context of the other factors identified in Schedule 4(4) of the 2017 Regulations, given that any environmentally related health issues (both beneficial and adverse) are likely to result from, for example, any changes in living conditions resulting from noise, and increased employment opportunities. It is therefore proposed that population and human health effects of the Variation Development are incorporated within the relevant technical chapters of the EIA Report (Noise and Landscape & Visual (in respect of residential amenity in particular)).
- 15.3.2 However, to clearly demonstrate that population and human health effects are included in the EIA Report, and to assist with ease of reference, it is proposed that a summary table that identifies the potential effects and the EIA Report chapter that considers the matter in more detail would be included (either as an appendix or within a succinct 'Other Issues' chapter).

### 15.4 Climate

- 15.4.1 The vulnerability of the Consented Development to climate change and extreme climate events was considered within the engineering design element of the 2015 ES and it is not proposed that a separate EIA Report chapter on 'Climate' is prepared, but any effects on climate would be considered in relevant technical assessments. A Peat Slide Risk Assessment was undertaken as part of the 2015 ES and updated for the 2017 FEI and as the location of all infrastructure would remain unchanged from that of the Consented Development, no further updates to this are required.

- 15.4.2 An updated carbon balance calculator would be undertaken using the most recent version of the spreadsheet available on the Scottish Government website and this would be reported in the Renewable Energy Policy, Carbon Balance and Peat Management EIA Report chapter.
- 15.4.3 Given the non-emitting nature of a wind farm and the fact that it is a renewable technology, it is not proposed undertake an additional greenhouse gas (GHG) assessment.

## 15.5 Sustainable Resource Use

- 15.5.1 Although application sites for wind turbine development can encompass large areas of land, the actual built development covers a relatively small area and, in most circumstances, farming and other land based activities would continue in and around turbine development. As a result of this, the Variation Development (and Consented Development) would only result in a small land take, which is unlikely to result in significant environmental effects in terms of land use.
- 15.5.2 In terms of soil and peat, the design of tracks, turbine foundations, hardstanding, borrow pits etc. has minimised the amount of soil disturbance. Where soils and peat would be excavated, they would be stored on the Development Site in accordance with the Peat Management Plan undertaken for the 2015 ES and updated for the 2017 FEI; and the Construction and Environmental Management Plan (CEMP) would guide restoration of the site post construction to minimise the loss of soil and peat resource.
- 15.5.3 With regards water, the key environmental effects of this natural resource would be its use during the construction, operational and decommissioning phases, the potential increase in flood risk and the disturbance of surface and groundwater as a result of construction activities. With regards to construction works, the water resource would be managed in accordance with the CEMP. With regards to surface and groundwater, any effects were set out in the Hydrology, Hydrogeology and Geology chapter of the 2015 ES and 2017 FEI and it is not proposed to update these given that no significant effects were predicted and the location of all infrastructure, construction/decommissioning methodology etc. remain unchanged.
- 15.5.4 The potential effects of the Consented Development on biodiversity were primarily addressed within the Ecology and Ornithology chapters of the 2015 ES, with appropriate mitigation set out in order to minimise the potential damage to habitats and species during the construction, operation and decommissioning. As the proposed changes to the Consented Development will not alter previous conclusions presented in the 2015 ES and 2017 FEI (with the possible exception of bird/bat collision risk), previously described mitigation remains applicable. Mitigation measures would also be detailed in a Habitat Management Plan, which it is expected would be required by planning condition, and also within the CEMP.
- 15.5.5 As a result, it is not proposed that Sustainable Resource Use is considered as a discrete section of the EIA Report for the Variation Development.

## 15.6 Major Accidents and Disasters

- 15.6.1 The scope for the EIA to consider major accidents and disasters has been initially considered in **Table 15.1** below. Major accidents or disasters have been scoped in where they represent a high risk to the Variation Development, either from the proposed location or from the project itself. A high risk is considered to be where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to the requirement for mitigation which is beyond the usual scope of construction or operational activities. Where an

accident or disaster has been scoped in, the Variation Development EIA Report chapter(s) identified would consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of appropriate mitigation.

Table 15.1 Major Accidents and Disasters

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	EIA Report Chapter
<b>Biological hazards: epidemics</b>	Very low	Very low	Out	The probability of epidemics which would affect the construction or operation of the Variation Development is considered to be very low.	N/A
<b>Biological hazards: animal and insect infestation</b>	Very low	Very low	Out	The probability of animal and insect infestations which would affect the construction or operation of the Proposed Development is considered to be very low.	N/A
<b>Earthquakes</b>	No	No	Out	Any earthquakes in the vicinity of the Variation Development would be of a very small magnitude and the design of turbine foundations etc. is adequate to withstand such low magnitude events.	N/A
<b>Tsunamis / tidal waves / storm surges</b>	No	No	Out	The general location of the Variation Development and its distance from the coast means there is no risk of these phenomena affecting the	N/A



Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	EIA Report Chapter
				Variation Development.	
<b>Volcanic eruptions</b>	No	No	Out	There are no active volcanos in the vicinity of the Variation Development.	N/A
<b>Famine / food insecurity</b>	Negligible	Very low	Out	The probability of famine / food insecurity which would affect the construction or operation of the Variation Development is considered to be negligible.	N/A
<b>Displaced populations</b>	Negligible	Very low	Out	The probability of displaced populations affecting the construction or operation of the Variation Development is considered to be very low.	N/A
<b>Landslide / subsidence</b>	Low	Low	Out	The peatslide risk assessment presented as Appendix 6.B of the 2015 ES and updated for the 2017 FEI concluded that there would be a low to moderate risk of peatslide as result of the Consented Development. As ground level infrastructure would not change as a result of the Variation Development, this is not expected to change.	Renewable Energy Policy, Carbon Balance and Peat Management
<b>Severe weather: storms</b>	Medium	No	Out	Turbines are equipped with	N/A

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	EIA Report Chapter
				lightning conductors and automatically shut down when wind speeds are at a level which could damage internal components.	
<b>Severe weather: droughts</b>	Very Low	No	Out	The probability of severe drought occurring in the vicinity of the Variation Development is considered to be very low. Furthermore, turbines would be unaffected by drought conditions.	N/A
<b>Severe weather: extreme temperatures</b>	Low	Very Low	In – severe cold weather could lead to ice build-up on blades.	Ice build-up could lead to ice throw, or to blade damage and throw.	Site Selection and Design Evolution (other chapters depending if a constraint is still within 'safe distance').
<b>Floods</b>	Low	Very Low	Out	Although land around watercourses on site is within identified flood zones, this was assessed as not being a significant effect in the 2015 ES and 2017 FEI, and as and ground level infrastructure would not change as a result of the Variation Development, this is not expected to change.	Site Selection and Design Evolution and Hydrology, Hydrogeology & Geology.
<b>Terrorist incidents</b>	No	No	Out	N/A	N/A

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	EIA Report Chapter
<b>Cyber attacks</b>	No	No	Out	N/A	N/A
<b>Disruptive industrial action</b>	No	No	Out	N/A	N/A
<b>Public disorder</b>	No	No	Out	N/A	N/A
<b>Wildfires</b>	Very Low	No	Out	Due to the location of the Variation Development, the probability of wildfires occurring in the vicinity of the Variation Development is considered to be very low.	N/A
<b>Severe space weather</b>	No	No	Out	N/A	N/A
<b>Poor air quality events</b>	No	No	Out	N/A	N/A
<b>Transport accidents</b>	No	Yes	Out	Abnormal loads or an increase in traffic could lead to an increased risk of accidents. However the 2015 ES and 2017 FEI concluded that this effect would not be significant and the only effect from the Variation Development would be an increase in oversail from longer blades which is not expected to increase the risk of accidents.	N/A
<b>Industrial accidents</b>	No	Yes	In – from construction and maintenance activities.	Manual labour, working at height and use of specialist plant all bring risk of industrial accidents. Relevant UK health and safety	Construction activities are covered by separate H&S legislation and guidelines.  Site Selection and Design Evolution, Geology, Hydrology,

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	EIA Report Chapter
				legislation will be adhered to; site construction management practices will include, but are not limited to, temporary diversions of public rights of way, relevant signage and fencing as potential hazardous construction areas where appropriate.	and Hydrogeology and Ecology (pollution).
<b>Electricity, gas, water supply or sewerage system failures</b>	No	Yes	In – site contains electricity transmission cables.	Construction activities or turbine collapse could damage electricity infrastructure. All relevant health and safety legislation will be followed, and industry best practice guidance adhered to. HSE <i>GS6 Avoiding danger from overhead power lines</i> will be followed	Site Selection and Design Evolution; and Existing Infrastructure, Telecommunications and Broadcast Services.
<b>Urban fires</b>	No	No	Out	The Variation Development is not in close proximity to any urban areas.	

## 16. Aviation

- 16.1.1 Specific Advice Sheet Onshore Wind Turbines (Scottish Government, May 2014) identifies that wind turbines might impact on the safeguarding criteria relating to aviation infrastructure and operations. Wind turbines within radar Line of Sight (LoS), and therefore detectable by radar systems, reflect radio waves that can interfere with the system. Turbine induced radar clutter appearing on radar displays can affect the safe provision of Air Traffic Services as it can mask unidentified aircraft from the air traffic controller and/or prevent the accurate continued identification of aircraft under control. In some cases, radar reflections from the turbines can affect the performance of the radar system itself. Additionally, due to their height, wind turbines could also potentially present a collision risk to low flying aircraft, therefore affecting military low-level training flights.
- 16.1.2 The assessment undertaken for the 2015 ES and 2017 FEI concluded that the Development Site lies within the operational range of the NATS Lowther Hill En Route Primary Surveillance Radar (PSR) system and the Glasgow Prestwick Airport (GPA) PSR.
- 16.1.3 The Applicant is party to agreements with NATS and GPA to provide mitigation for the Consented Development, and such mitigation is expected to apply equally to the Variation Development.
- 16.1.4 As a result of previous consultation, the Ministry of Defence (MoD) did not raise an objection to the Consented Development subject to the Applicant satisfying a request for the fitting of a form of aviation obstruction lighting.

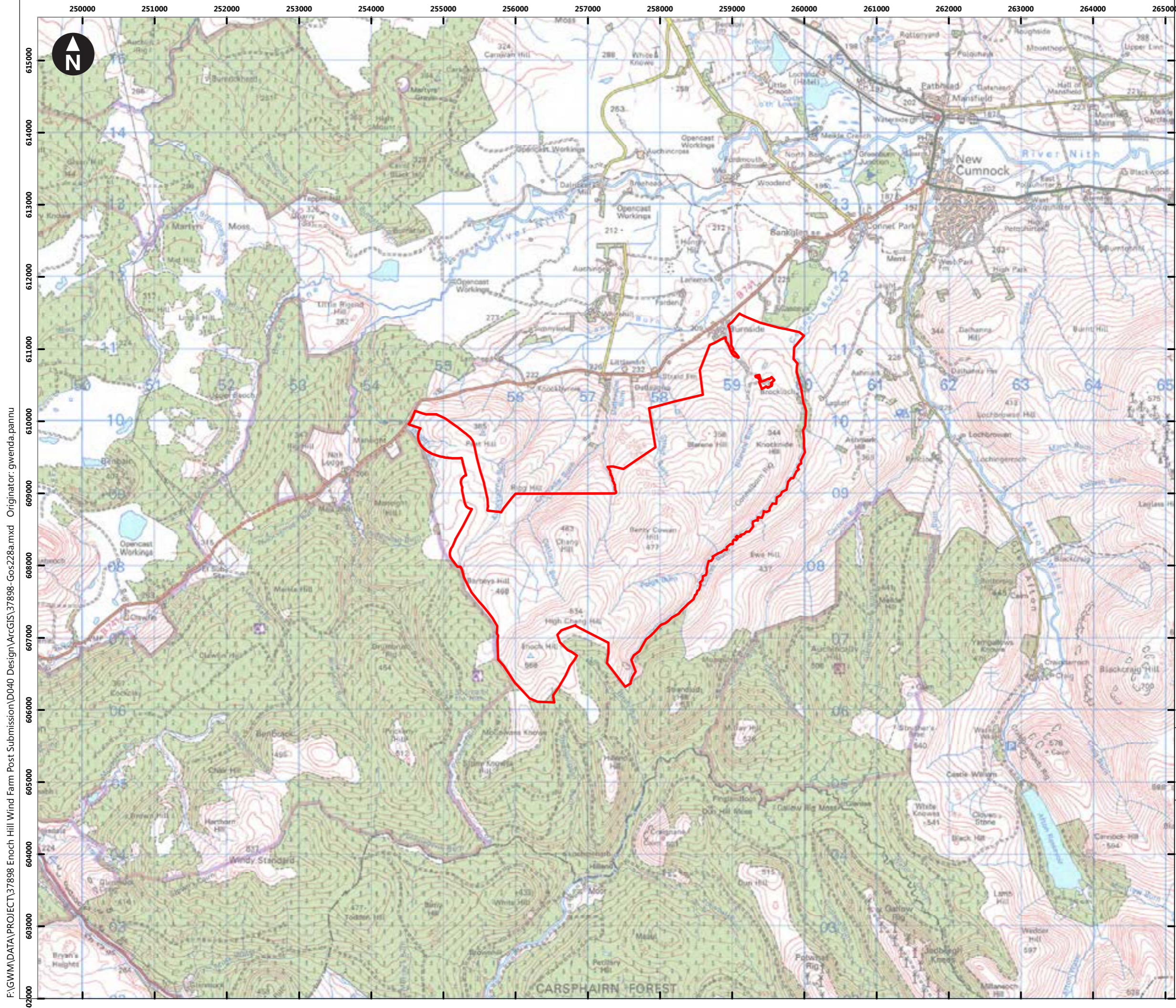


# Appendix A

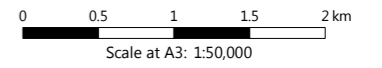
## Figures







Key  
 Site boundary



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Client



Enoch Hill Wind Farm Variation Application  
 Scoping Report

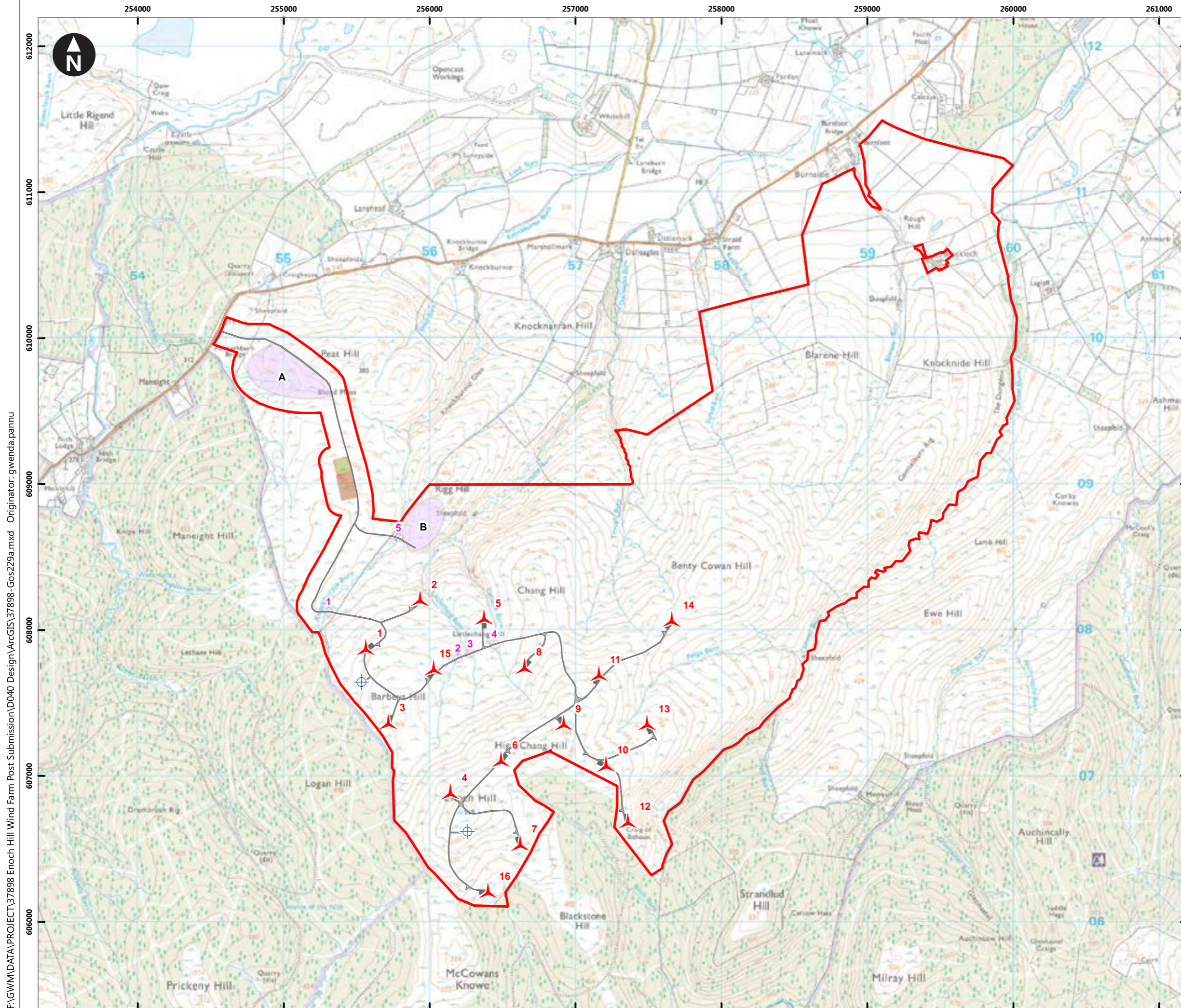
**Figure 1.1**  
 Site location

January 2020



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- Key
- Site boundary
  - ▲ Turbine location
  - ⊕ Permanent meteorological mast
  - Crane pads
  - Wind farm access tracks
  - Substation
  - Watercourse crossing
  - Borrow pit search area
  - Temporary construction compound

0 0.5 1 1.5 km  
 Scale at A3: 1:25,000  
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Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 1.2**  
**Site layout**

January 2020







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Key

-  Proposed Turbine Locations
-  Landscape and Visual Study Area  
Note: The study area is based on a 41,259m radius circle that allows a minimum of 40km distance from each of the proposed turbine locations
-  Local authority boundaries
-  Lines indicating the distance from proposed turbines

0 2 4 6 8 10 12 14 16 18 km  
Scale at A3: 1:325,000  
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Client



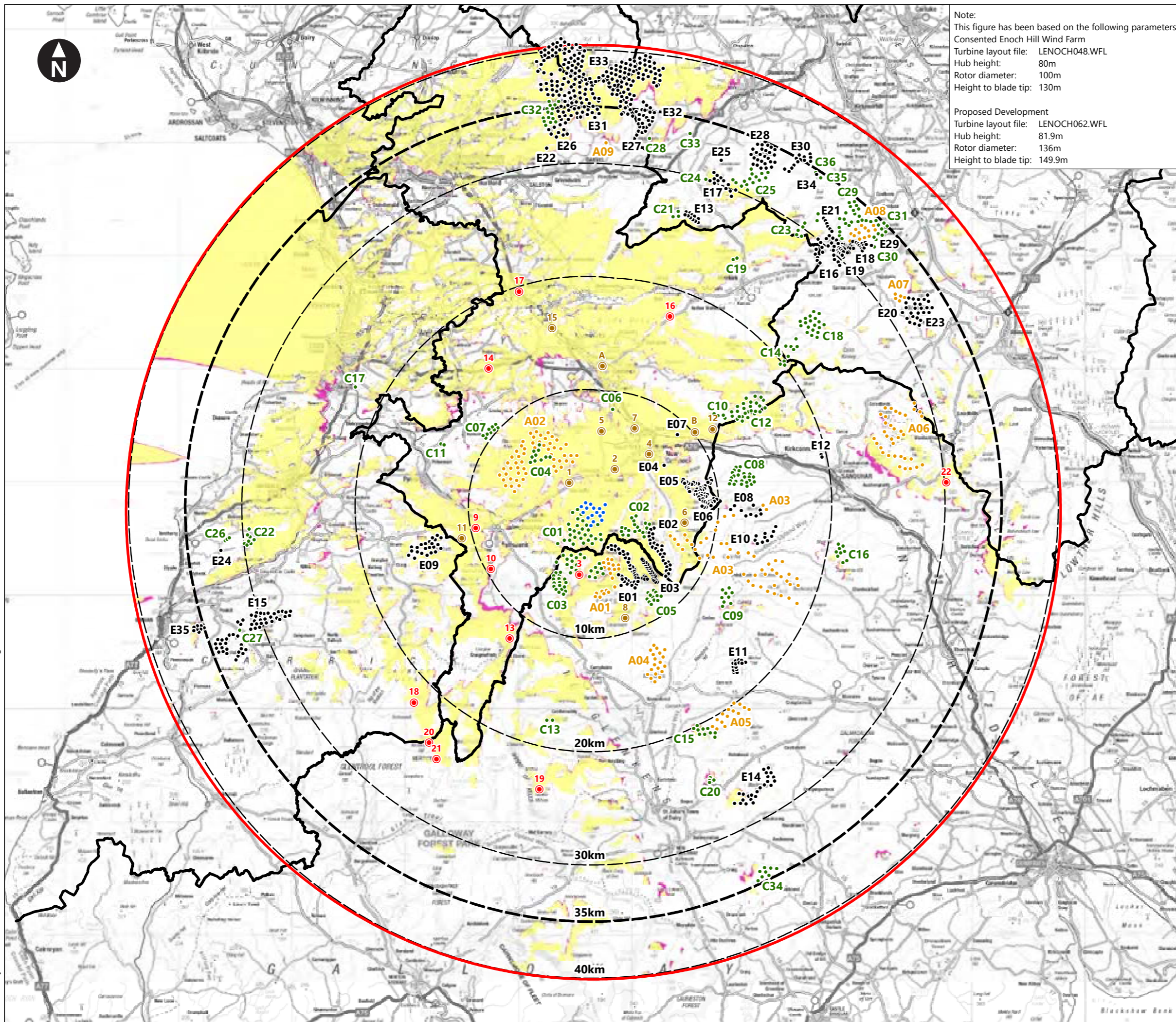
Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.1**  
Landscape and Visual Study Area

January 2020



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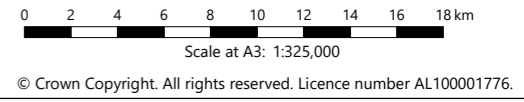
Note:  
 This figure has been based on the following parameters:  
 Consented Enoch Hill Wind Farm  
 Turbine layout file: LENOCH048.WFL  
 Hub height: 80m  
 Rotor diameter: 100m  
 Height to blade tip: 130m  
 Proposed Development  
 Turbine layout file: LENOCH062.WFL  
 Hub height: 81.9m  
 Rotor diameter: 136m  
 Height to blade tip: 149.9m

- Key
- Proposed Turbine Locations
  - Landscape and Visual Study Area
  - Local authority boundaries
  - Lines indicating the distance from the proposed turbines
  - Combined zone of theoretical visibility of the Consented Enoch Hill Wind Farm and the Proposed Development calculated to hub height
  - Additional zone of theoretical visibility of the Proposed Development calculated to hub height

- Proposed Viewpoints
- |  |  |
|--|--|
| 1) B741 North East of Dalmellington          | 7) Lochside Hotel                      |
| 2) B741 South West of New Cumnock            | 8) Cairnmore of Carsphairn             |
| 4) New Cumnock Cemetery                      | 11) Auchenyroy Hill                    |
| 5) Highpoint north of site (near Auchinross) | 12) Corsencon Hill                     |
| 6) Blackcraig Hill South of New Cumnock      | 15) A76 North of Auchinleck            |
|  | A) Drumbrochan Road (near Auchinross)  |
|  | B) Little Garclaugh, Upper Nith Valley |

- Proposed Viewpoints to be Scoped Out
- |                                       |                         |
|---------------------------------------|-------------------------|
| 3) Core Path 667 Water of Deugh       | 17) A76 Mauchline       |
| 9) Bogton Loch                        | 18) Shalloch on Minnoch |
| 10) Fort Carrick                      | 19) Meikle Millieya     |
| 13) Loch Doon Shore                   | 20) Kirrieroch Hill     |
| 14) A70 between Cumnock and Prestwick | 21) Merrick             |
| 16) A70 North East of Cumnock         | 22) East Mount Lowther  |

Notes: For cumulative wind farm codes refer to Figure 8.3.  
 This drawing is based on a computer generated Zone of Theoretical Visibility (ZTV). The areas shown indicate the maximum theoretical visibility of the proposed turbines using OS Terrain 50 data only and do not take account of any screening from vegetation or built-form. The ZTV also includes an adjustment that allows for the Curvature and Light Refraction of the Earth.



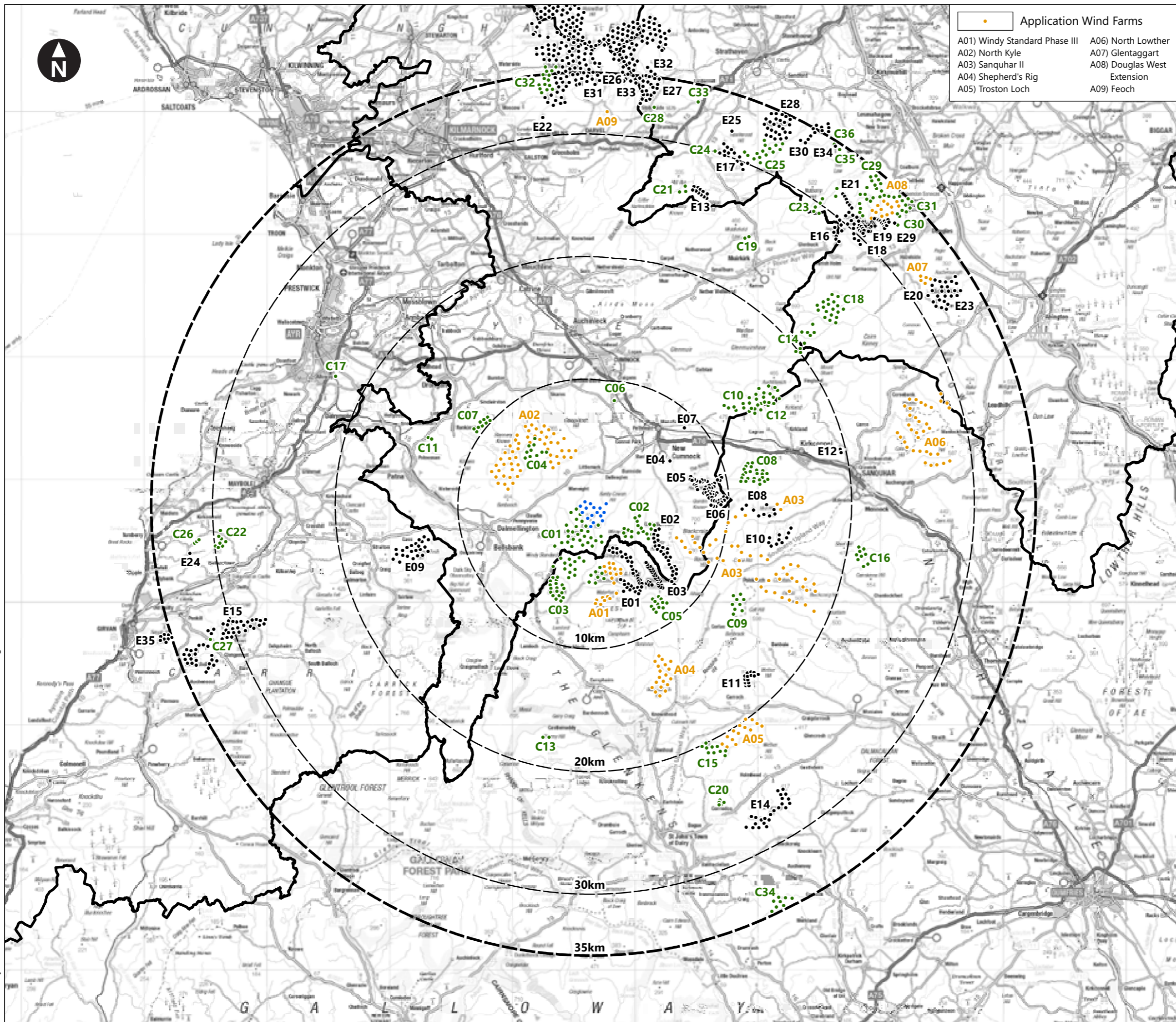
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Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.2**  
**Comparative ZTV with Viewpoints**

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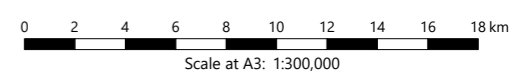
- Application Wind Farms**
- A01) Windy Standard Phase III
  - A02) North Kyle
  - A03) Sanquhar II
  - A04) Shepherd's Rig
  - A05) Troston Loch
  - A06) North Lowther
  - A07) Glentaggart
  - A08) Douglas West Extension
  - A09) Feoch

- Key**
- Proposed Turbine Locations
  - Local authority boundaries
  - Lines indicating the distance from the proposed turbines
  - Existing / Under Construction Wind Farms

- Existing / Under Construction Wind Farms**
- E01) Windy Standard Extension
  - E02) Afton
  - E03) Windy Standard
  - E04) High Park Farm
  - E05) Hare Hill
  - E06) Hare Hill Extension
  - E07) Mansfield Mains \*
  - E08) Sanquhar
  - E09) Dersaloch
  - E10) Whiteside Hill
  - E11) Wether Hill
  - E12) Sunnyside
  - E13) Bankend Rig
  - E14) Blackcraig
  - E15) Hadyard Hill
  - E16) Galawhistle
  - E17) Dungavel
  - E18) Hagshaw Hill Extension
  - E19) Hagshaw Hill
  - E20) Andershaw
  - E21) Nutberry
  - E22) Low Bowhill
  - E23) Middle Muir
  - E24) North Threave Farm
  - E25) West Dykes
  - E26) Whitelee Extension 2
  - E27) Calder Water
  - E28) Kype Muir
  - E29) Hazelside Farm (T1)
  - E30) Auchrobert
  - E31) Whitelee Extension 1
  - E32) West Browncastle
  - E33) Whitelee
  - E34) Low Waterhead
  - E35) Tralorg

- Consented Wind Farms**
- C01) South Kyle
  - C02) Pencloe
  - C03) Benbrack
  - C04) Over Hill
  - C05) Windy Rig
  - C06) Taiglim Farm \*
  - C07) Polquhain
  - C08) Sandy Knowe
  - C09) Lorg
  - C10) Lethans
  - C11) Knockshinnoch
  - C12) Glenmuckloch
  - C13) Torrs Hill
  - C14) Penbreck
  - C15) Glenshimmeroch
  - C16) Twentysilling Hill
  - C17) NHS Ailsa Hospital
  - C18) Kennoxhead
  - C19) Linburn Farm
  - C20) Knockman Hill
  - C21) Bankend Rig Extension
  - C22) Kirk Hill
  - C23) Cumberhead
  - C24) Stonyhill Farm
  - C25) Kype Muir Extension
  - C26) Chapelton Farm
  - C27) Penwhapple Reservoir
  - C28) Mount Farm
  - C29) Dalquhandy
  - C30) Hazelside Farm (T2)
  - C31) Douglas West
  - C32) Sneddon Law
  - C33) Hallburn Farm
  - C34) Mochrum Fell
  - C35) Cleughhead Farm
  - C36) High Waterhead

\* Micro generation schemes less than 50m to blade tip



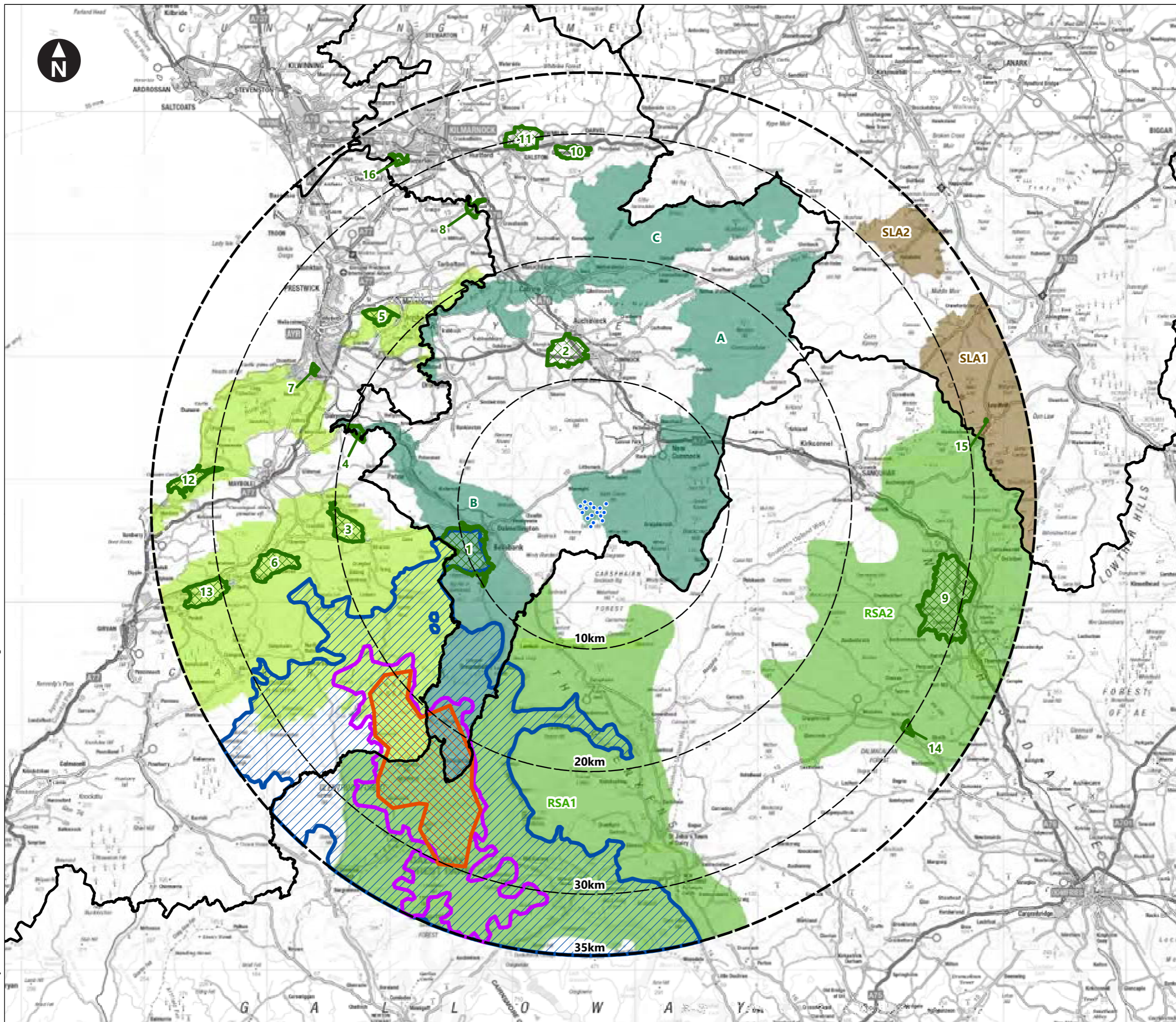
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Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.3**  
**Cumulative Base Plan**

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Key

- Proposed Turbine Locations
- Local authority boundaries
- Lines indicating the distance from the proposed turbines

**Landscape Planning Designations**

- East Ayrshire Sensitive Landscape Character Areas (SLCA)
  - A) Afton SLCA
  - B) Doon Valley SLCA
  - C) The Ayr Valley SLCA
 Note: Sourced from <http://maps.ayrshire.gov.uk/mapsAJP/mapWindfarmSearch.htm>
- South Ayrshire Scenic Areas
   
Note: Sourced from [www.south-ayrshire.gov.uk](http://www.south-ayrshire.gov.uk)
- South Lanarkshire Special Landscape Area
   
SLA1) Leadhills and Lowther Hills SLA2) Douglas Valley
   
Note: Sourced from South Lanarkshire Local Development Plan 2015
- Dumfries and Galloway Regional Scenic Areas
   
RSA1) Galloway Hills RSA2) Thornhill Uplands
   
Note: Sourced from Dumfries and Galloway Council LDP 2, Regional Scenic Areas, Technical Paper, January 2018
- Gardens and Designed Landscapes
 

1) Craigengillan	9) Drumlanrig Castle
2) Dumfries House	10) Lanfine
3) Blairquhan	11) Loudon Castle
4) Skeldon House	12) Culzean Castle
5) Auchincruive	13) Bargany
6) Kilkerran	14) Maxwellton (Glencairn Castle)
7) Rozelle (La Rochelle)	15) Scot's Mining Company House
8) Carnell	16) Caprington Castle
- Wild Land Area: Merrick
- Galloway Forest Dark Sky Park**
  - Core Area
  - Buffer Area
 Note: Sourced from Dumfries and Galloway Council Local Development Plan - Supplementary Guidance, August 2015

0 2 4 6 8 10 12 14 16 18 km  
Scale at A3: 1:300,000  
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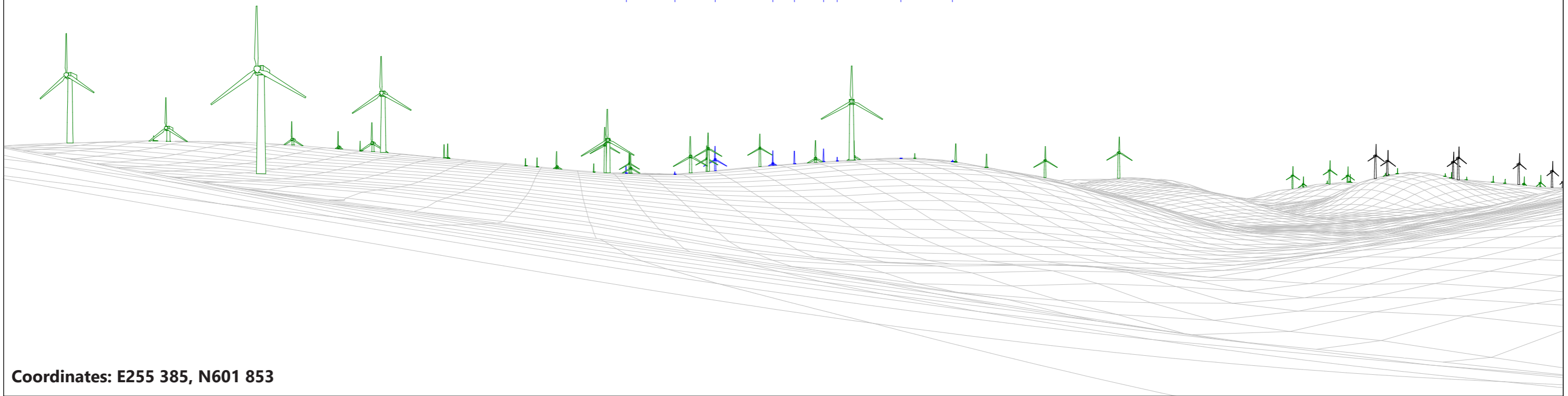
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Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.4**  
Landscape Planning Designations

**VP3 - Core Path 667 Water of Deugh**

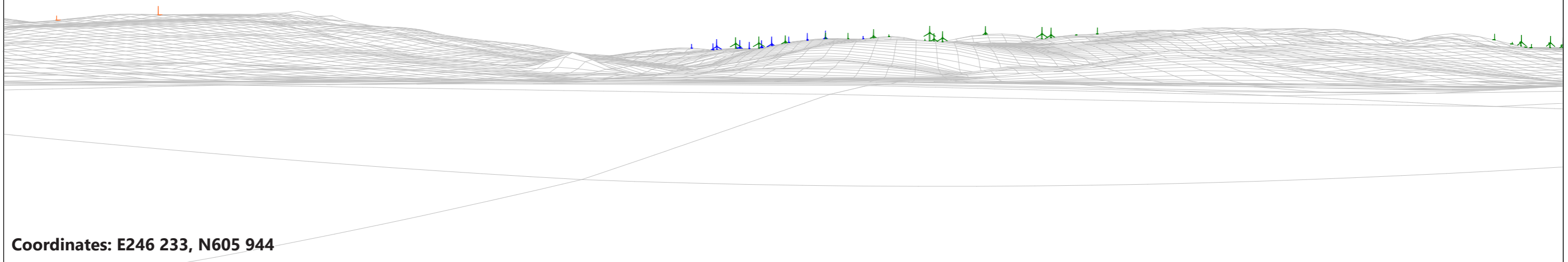
3 15 4 6 16 7 9 10 12



**Coordinates: E255 385, N601 853**

**VP9 - Bogton Loch**

2 5 1 14 15 8 11 3 9 6 4 7



**Coordinates: E246 233, N605 944**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length

Client



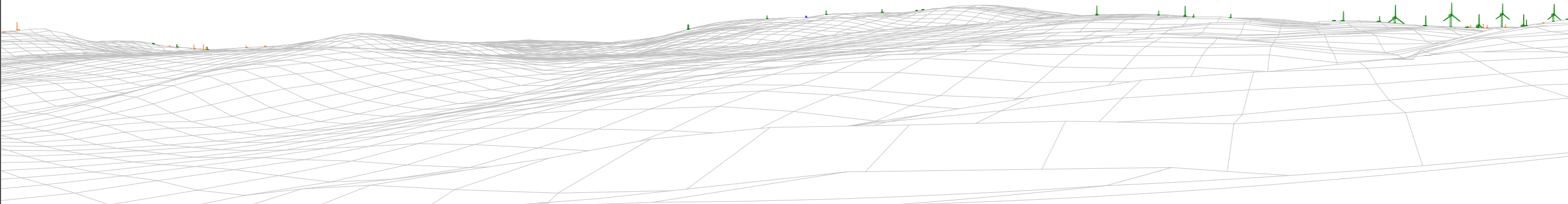
Enoch Hill Wind Farm Variation Application  
 Scoping Report

**Figure 8.5a**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 3 & 9**

January 2020

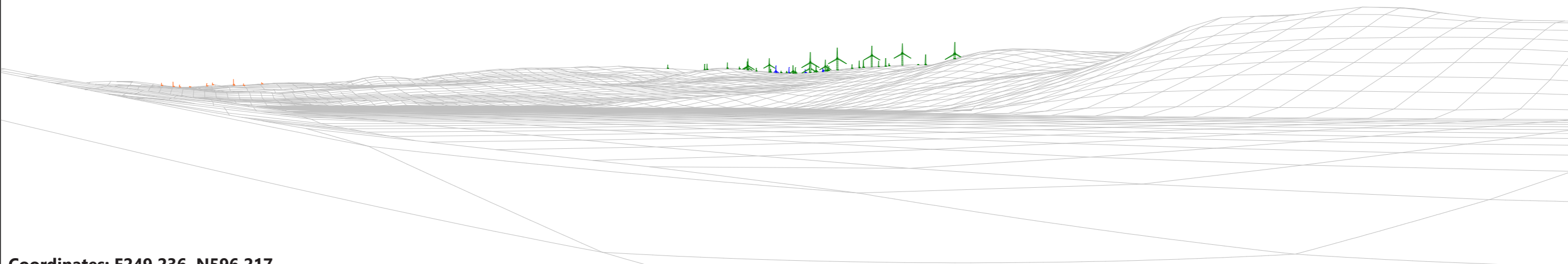
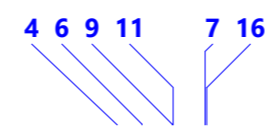


**VP10 - Fort Carrick**



**Coordinates: E247 560, N602 333**

**VP13 - Loch Doon Shore**



**Coordinates: E249 236, N596 217**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length



Enoch Hill Wind Farm Variation Application  
 Scoping Report

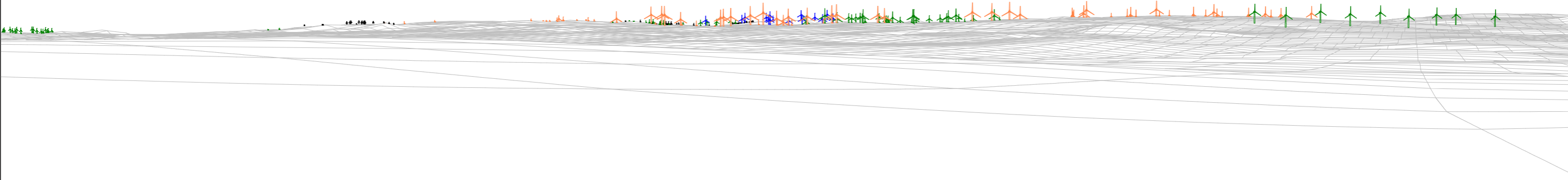
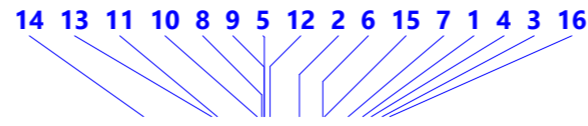
**Figure 8.5b**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 10 & 13**

January 2020



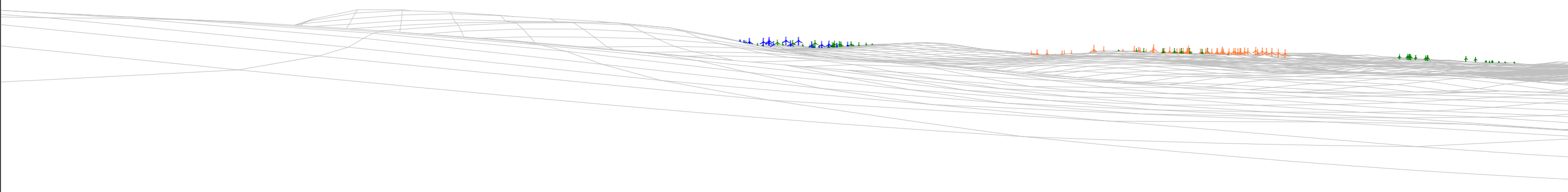
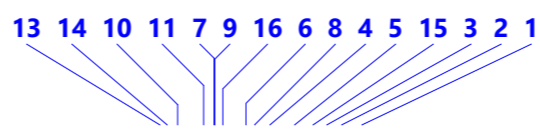
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**VP14 - A70 between Cumnock and Prestwick**



**Coordinates: E247 353, N620 045**

**VP16 - A70 North East of Cumnock**



**Coordinates: E263 390, N624 657**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length



Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.5c**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 14 & 16**

January 2020

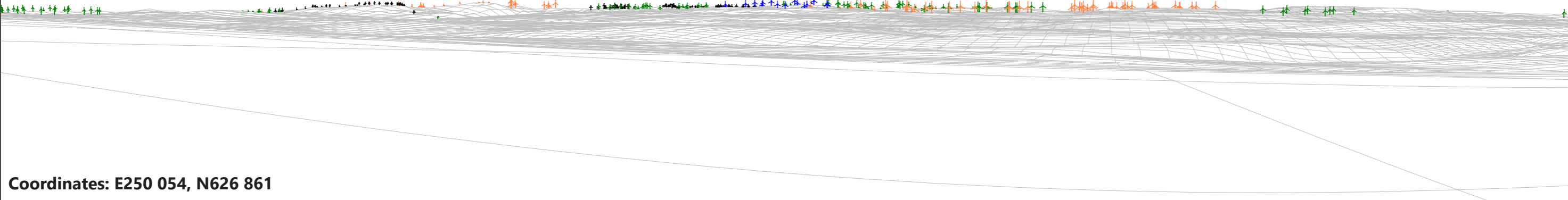
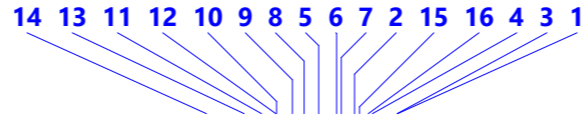


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**VP17 - A76 Mauchline**

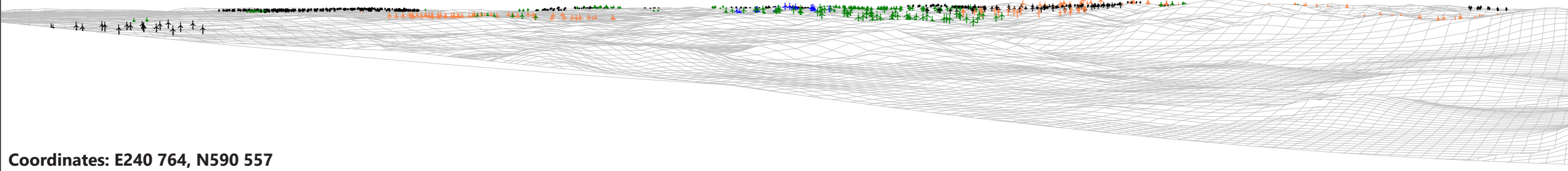
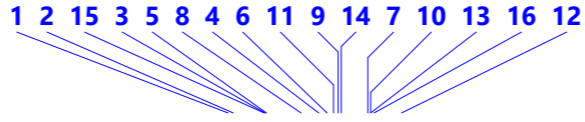
14 13 11 12 10 9 8 5 6 7 2 15 16 4 3 1



**Coordinates: E250 054, N626 861**

**VP18 - Shalloch on Minnoch**

1 2 15 3 5 8 4 6 11 9 14 7 10 13 16 12



**Coordinates: E240 764, N590 557**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length

Client



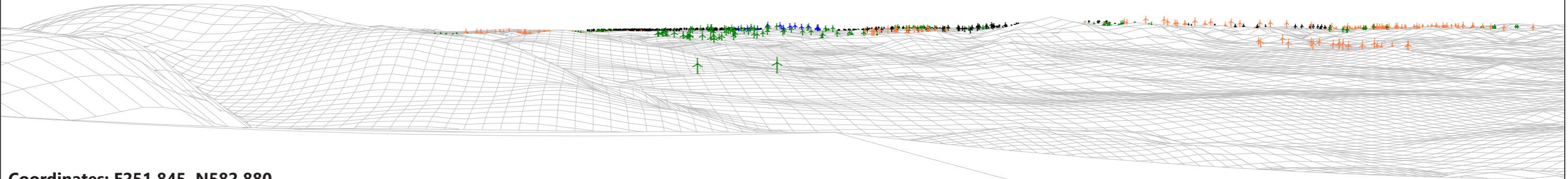
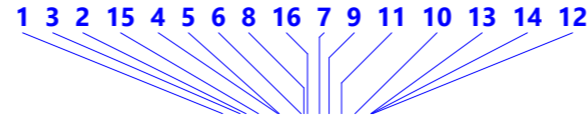
Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.5d**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 17 & 18**

January 2020

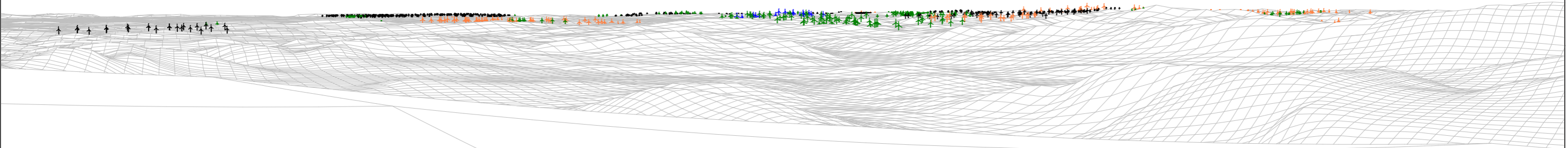
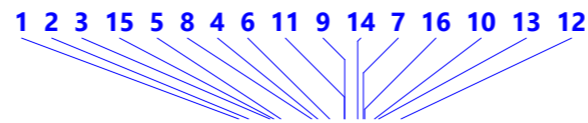


**VP19 - Meikle Millyea**



**Coordinates: E251 845, N582 880**

**VP20 - Kirriereoch Hill**



**Coordinates: E242 097, N586 987**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length

Client



Enoch Hill Wind Farm Variation Application Scoping Report

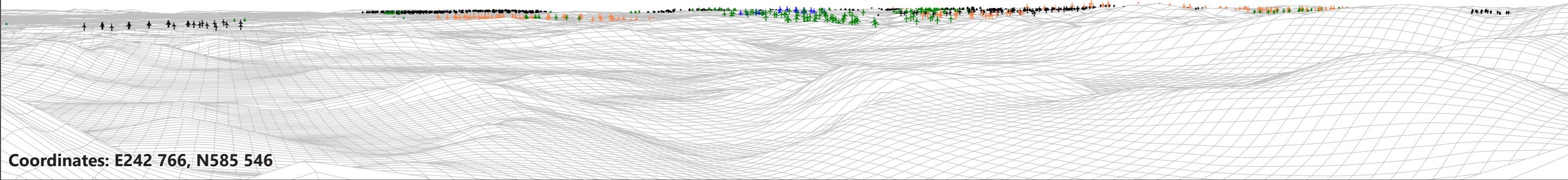
**Figure 8.5e**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 19 & 20**

January 2020



**VP21 - Merrick**

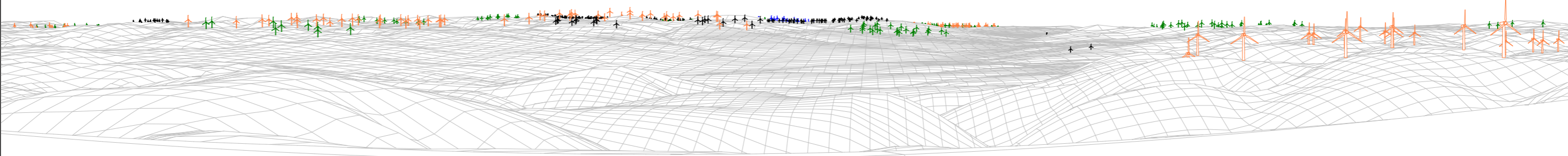
1 2 3 15 5 8 4 6 9 11 16 7 14 10 13 12



**Coordinates: E242 766, N585 546**

**VP22 - East Mount Lowther**

7 4 10 6 13 9 3 11 8 15 1 14 5 2



**Coordinates: E287 779, N609 999**

**Wind Farm Key:** Enoch Hill Variation Wind Farm Existing Consented Application

Notes:  
 (1) Horizontal field of view: 90°  
 (2) View flat at a comfortable arm's length



Enoch Hill Wind Farm Variation Application Scoping Report

**Figure 8.5f**  
**Proposed Scoped Out Viewpoint Wirelines**  
**Viewpoints 21 & 22**

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wood.

