

Chapter 2 - Environmental Impact Assessment

Introduction

- 2.1 Environmental Impact Assessment (“EIA”) is a process undertaken to identify and evaluate the likely significant effects of a proposed development on the environment and identify measures to mitigate or manage any significant adverse effects on the environment. The EIA carried out for the Development has been carried out on the basis of information collated by the applicant and appointed independent consultants through site survey and assessment work and following consultation with statutory consultees and other stakeholders.
- 2.2 The requirement of the European Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by the European Council Directive 97/11/EC, Council Directive 2003/35/EC and Council Directive 2009/31/EC, are transposed with regard to the development in question by the EIA Regulations¹.
- 2.3 Schedule 2 of the EIA Regulations lists developments for which an EIA must be undertaken where there are likely to be significant effects on the environment by virtue of factors such as its nature, size or location within a sensitive area, including “installations for the harnessing of wind power for energy production (wind farms)”.
- 2.4 Under the EIA Regulations, a wind farm consisting of more than 2 wind turbines and/or comprising turbines with a hub height of in excess of 15m exceeds the threshold of Schedule 2 type development. This means that it may need an Environmental Impact Assessment (EIA) if it is likely to have a significant effect on humans or the environment due to the character or location of the development in relation to humans and sensitive environmental receptors.

¹ Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 as amended.

- 2.5 Due to the scale of the development, its location in relation to other windfarm developments, the proximity to sensitive landscapes and the fact that EIA was undertaken for the previously proposed wind farm at the Site a decision has been taken to undertake an Environmental Impact Assessment.

Environmental Impact Assessment

- 2.6 The EIA should be an iterative process rather than a unique, post design environmental appraisal. In this way the findings of the technical environmental studies can be used to inform the design of the development, and hence achieve a 'best fit' within the environment. This approach has been adopted in respect of the Development, where potentially significant effects have been identified and every effort has been made to avoid these, through evolving the design of the Development. This is referred to within this ES as 'embedded mitigation'.

The Environmental Statement

- 2.7 The environmental information presented in this Environmental Statement is derived through a systematic process of identification, evaluation and prediction of the likely environmental effects of the development, critically identifying those considered to be significant in terms of the EIA Regulations. Together with any post consultation amendments, this document will aid the Inspectorate and Welsh Ministers in considering and determining the planning application for the Development.
- 2.8 The aim of this Environmental Statement is to provide a systematic and objective account of the significant environmental effects likely to arise from the proposed development, including sufficient information to verify the conclusions and identify the source of the information provided. Regulation 17 and Schedule 4 of the EIA Regulations specify the information to be included in an ES.
- 2.9 Regulation 17(3) of the EIA Regulations details the information that is to be included within

an Environmental Statement:

“(3) An environmental statement is a statement which includes at least—

(a) A description of the proposed development comprising information on the site, design, size and other relevant features of the development;

(b) A description of the likely significant effects of the proposed development on the environment;

(c) A description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) A description of the reasonable alternatives studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment;

(e) A non-technical summary of the information referred to in sub-paragraphs (a) to (d);

And

(f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.”

(4) An environmental statement must –

(a) Be prepared by persons who in the opinion of the relevant planning authority or the Welsh Ministers, as appropriate, have sufficient expertise to ensure the completeness and quality of the statement;

(b) Contain a statement by or on behalf of the applicant or appellant describing the expertise of the person who prepared the environmental statement;

(c) Where a scoping opinion or direction has been issued in accordance with regulation 14 or 15, be based on the most recent scoping opinion or direction issued (so far as the proposed development remains materially the same as the proposed development which was the subject of that opinion or direction);

(d) Include the information reasonably required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment; and

(e) Take into account other relevant environmental assessments required under Union legislation or any other provision of domestic legislation, with a view to avoiding duplication of assessment.”

2.10 Schedule 4 of the EIA Regulations requires that the following information is provided:

PART I

1. Description of the development, including in particular—

(a) a description of the location of the development;

(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works and the land-use requirements during the construction and operational phases;

(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;

(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, oil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operational phases.

2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the applicant or appellant which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in regulation 4(2) 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 hydro morphological 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.

5. A description of the likely significant effects of the development on the environment resulting from, inter alia—

(a) the construction and existence of the development, including, where relevant, demolition works;

(b) the use of natural resources in particular land, soil, water and biodiversity, considering

as far as possible the sustainable availability of these resources;

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances and the disposal and recovery of waste,

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at European Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC1 and Directive 2009/147/EC2 .

6. A description of the forecasting methods or evidence used to identify and assess the effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of

any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of the Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies. 9. A non-technical summary of the information provided under paragraphs 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

The EIA Process

Identification of Site

- 2.11 In identifying specific sites for further investigation into wind energy development, landownership and support from landowners are essential. Suitable sites may be identified through consideration to the various criteria listed below but would not be suitable for development without the owners' approval.
- 2.12 When identifying a site for the current proposal the Applicant considered the following criteria:

- i. Wind resources (as measured by on site measurement and wind speed databases)
- ii. Size of the site and current land uses
- iii. Planning policy
- iv. Grid connection analysis
- v. Statutory designations
- vi. Land availability and legal issues
- vii. Access issues (both to site and on site)
- viii. Proximity to dwellings
- ix. Initial ecological, hydro-geological, archaeological analysis
- x. Existing infrastructure

Design Considerations

2.13 The Site was initially identified by the Applicant in 2011. When considering how a wind farm should be designed on the Site, a number of alternative layouts were investigated based on the impact on the surrounding environment. The first design was based on the maximum energy output of the turbines that could be placed within the site boundary.

2.14 A number of different turbine designs and specifications were used ranging in size from 660 kW turbines to 3 MW turbines. The review exercise examined scenarios of six turbines at 105m and five turbines at 125m, four turbines at 125m and five turbines at 100m. As part of the exercise a Zone of Theoretical Vision (ZTV), broadly representing three chimneys of the Valero Oil Refinery, set a nominal height of 160m was also generated. During this review exercise it was noted that one turbine which would have been to the south of the final layout should be omitted to allow the array to be located within a single valley and

appear as a more compact array. This recommendation was accepted and reflected in the final design.

- 2.15 The outcome of the comparison of the ZTVs was that there was remarkably little difference between the four ZTVs generated. The Applicant selected a tip height of 100m because it reflected the scale of the operational turbines at the nearby Wear Point Wind Farm (Ref: 09/0544/PA) and reflected the guidance in the Pembrokeshire Coast National Park Authority's Supplementary Planning Guidance on wind farm development with regard to the closest Landscape Character Area (LCA) (LCA 6: Castlemartin/Merrion Ranges) where it identifies an opportunity for turbines up to 100m tall close to the existing refinery infrastructure.
- 2.16 For these reasons, coupled with the site's location within the Haven Waterway Enterprise Zone with a good wind regime, the 2.5MW turbines (100m to tip) were chosen. Consultation with a number of turbine manufacturers was also undertaken to establish the specific turbine specifications most suitable for the site. Following a decision on the type of turbines the preliminary layout was designed.
- 2.17 This exercise was undertaken in 2012 - 2013 when wind turbines were not as efficient and were more limited in output.

Scoping and Consultation

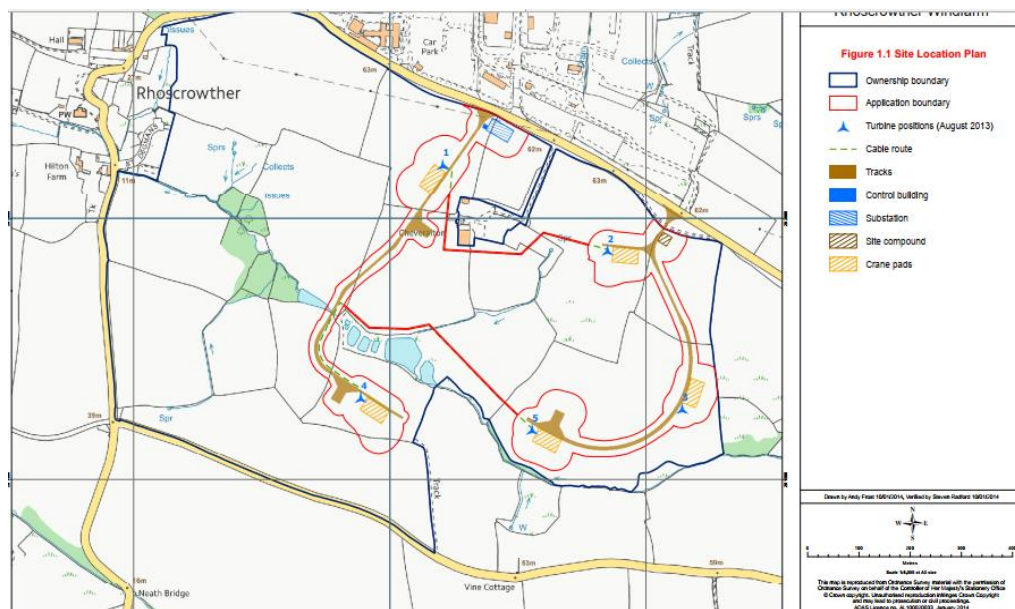
- 2.18 A Scoping Report by the applicant was submitted to Pembrokeshire County Council on 11th September 2013. An Opinion was then issued by the Local Authority on 22nd November 2013 (Ref: SC/0460/13).
- 2.19 The scope of this ES was also guided by the direct consultations with various statutory and non-statutory consultees which represent key stakeholders in technical, environmental and socio-economic interests.
- 2.20 Relevant consultation scoping responses were forwarded onto the specialist consultants to

take into consideration during their 2014 assessments. As a part of the wider consultation process, a public exhibition was undertaken in July 2013 to inform and discuss the Development with members of the public in advance of finalising the design.

2014 Application

- 2.21 In 2014 the Applicant submitted a planning application to Pembrokeshire County Council for permission to construct and operate a wind farm consisting of five turbines. Each turbine was to be 100m to tip with a total installed capacity of 2.5MW per turbine (total capacity of 12.5MW).
- 2.22 An environmental statement was submitted with the 2014 application and was found (at both application stage and appeal stage) to be complete. The layout for the 2014 application is shown below.

2014 Layout



- 2.23 The application was refused by Pembrokeshire County Council in January 2015 and was appealed by the Applicant. In February 2016 a Planning Inspector appointed by the Welsh Ministers dismissed the appeal. The Appellant subsequently challenged the decision

pursuant to Section 288 of the Town and Country Planning Act 1990. The decision was subsequently quashed by the Courts.

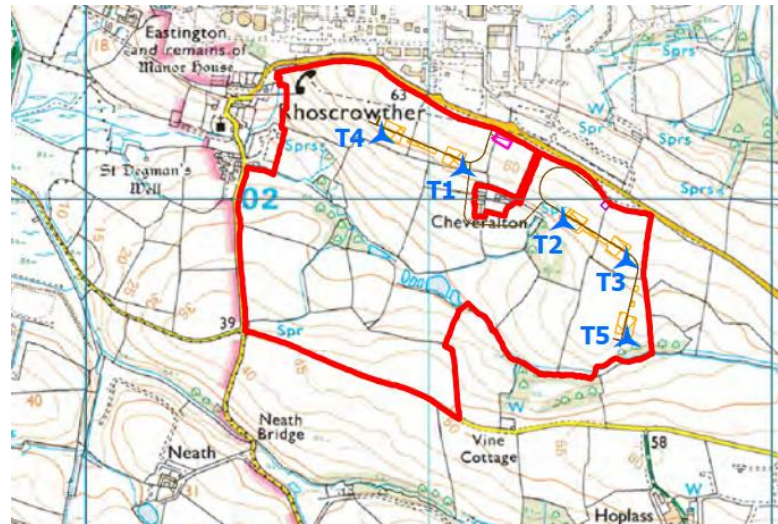
2.24 The appeal against refusal of planning application 13/0876/PA was redetermined following a second Inquiry held in December 2017. The appeal was recovered by the Cabinet Secretary for Energy, Planning and Rural Affairs who dismissed the appeal. The main considerations were the effect of the development on:

- i. The landscape character and visual amenity of the area, with particular reference to the nearby Pembrokeshire Coast National Park (PCNP).
- ii. The setting of heritage assets in the area, in particular the Rhoscrowther Church.

2020 Design

2.25 Following consideration of the environmental constraints at the Site and the in-depth analysis of the 2014 proposal (including the reasons for refusal), the Applicant redesigned the proposal to minimise the impacts of the Development while increasing the renewable energy generated.

2.26 A number of different layouts and turbines were considered. The Applicant concluded that a layout with five turbines close to Valero Oil Refinery would reduce any impact on the National Park and Rhoscrowther Church. The Applicant considered that a turbine with a tip height of 126.5m and a total installed capacity of 3.6MW (total of 18MW) would be the most suitable for the Development given the size of the nearby Valero chimneys. The layout for the 2020 design is included below.

2020 Design**Consultation**

- 2.27 In 2020 and 2021 the Applicant consulted with the necessary consultees as prescribed by the Developments of National Significance (Procedure) (Wales) Order 2016.
- 2.28 In light of the comments received by the consultees, particularly Cadw and Natural Resources Wales, the Applicant reconsidered the design of the proposal. Full details of the consultation responses are included within the consultation report that has been provided with the application.
- 2.29 Cadw stated that if turbine 4 was removed from the proposal, then *'the impact of the proposed windfarm on the historic environment would be reduced to a level which would not be significant'*.
- 2.30 Natural Resources Wales recommended that a proposal be revised to minimise the impacts of the proposal on the National Park.
- 2.31 In light of the response from Cadw the decision was taken by the Applicant to remove Turbine 4 from the proposal. Turbine 4 was also the turbine that was closest to the National

Park and its removal was consistent with the request of Natural Resources Wales. Having considered the request of Natural Resources Wales the Applicant considered that the removal of a further turbine and increasing the distances between the remaining turbines would minimise the effects on landscape, seascape and visual amenity (amongst other matters).

- 2.32 When considering the proposed changes as a result of the 2020/2021 consultation the Applicant reconsidered its candidate turbine. The Vestas V117 is slightly higher (8.5m to tip) than the turbines considered in the 2020 design however the output is 4.3MW per turbine, giving a total capacity for 3 turbines of 12.9MW. By comparison the total output for the 2014 proposal for 5 turbines was 12.5MW.
- 2.33 By reducing the number of turbines from 5 to 3 and by using the Vestas V117 as the candidate turbine, the Applicant has sought to address the matters raised in the consultation responses of Cadw and NRW, and to maximise the amount of renewable energy generated by the proposal.

Identification of Issues

- 2.34 As a result of the initial 2013 scoping response, consultation throughout the initial EIA process, the planning application and appeals process for the previous proposal, the following subjects have been technically assessed in this ES:
- i. Landscape and Visual
 - ii. Ecology
 - iii. Water & Soils
 - iv. The Historic Environment
 - v. Noise

- vi. Existing Infrastructure including aviation and telecommunications
- vii. Access and Traffic
- viii. Socio Economics including recreation and tourism, house prices and employment
- ix. Other Issues including shadow flicker and public safety.

2.35 Effects associated with all elements of the Development, including the construction, operation and decommissioning phases, access tracks and associated infrastructure, have been assessed in the EIA and reported in this Environmental Statement.

Technical Assessments

2.36 Each of the technical assessments follows a systematic approach, comprising the following principal steps:

- i. Assessment of methodology;
- ii. Description of baseline conditions in the context of the relevant planning policy and guidance;
- iii. Prediction of potential effects including cumulative effects;
- iv. Assessment of effects on the identified relevant receptors;
- v. Identification of appropriate mitigation measures;
- vi. Assessment of residual environmental effects after proposed mitigation has been incorporated.

2.37 These steps were adhered to throughout the EIA process and described in detail in individual chapters of the Environmental Statement. A concise description of the EIA steps is outlined in the following paragraphs.

Baseline Description

- 2.38 In order to evaluate potential environmental effects, information relating to the existing environmental conditions was collected. This is known as the baseline and used to assess what changes may take place during the construction, operation and decommissioning phases of the Development.
- 2.39 For each technical assessment subject, the baseline was established through a combination of the desk top studies, consultations with relevant consultees, consideration of the 2014 environmental statement and, where appropriate, field surveys were carried out. Data sources are described in each chapter of this Environmental Statement. The timing of the field work and the defined study area, specifically relating to the subject matter in question, are also outlined within each chapter.

Prediction of Potential Environmental Effects

- 2.40 During construction, operation and decommissioning of the Development, different environmental effects are likely to arise. For example, during the construction phase, traffic volumes are far greater than during the operation of the wind farm, while visual effects will be most prominent during the operational years. The potential environmental effects of the Development were assessed in the following contexts:
- i. Direct and indirect effects
 - ii. Short-term (construction or decommissioning) and long term (operation) effects
 - iii. Permanent and reversible effects
 - iv. Positive and negative effects
 - v. Cumulative effects
 - vi. Geographic scale: Local (on site and neighbouring area); Regional (district and

county); National and International levels.

2.41 Following the identification of potential environmental effects, the associated changes to baseline conditions as a result of wind farm development were evaluated and an assessment of the significance and acceptability of these changes was carried out, as outlined below.

Assessment of Effects

2.42 The resultant effects of the Development (whether positive, neutral or negative) would be influenced by a combination of the sensitivity of the receiving environment and the predicted degree of alteration (the 'magnitude') from the baseline state.

2.43 Environmental sensitivity may be categorised by a multitude of factors; such as the status of rare or endangered species; transformation of natural landscapes; soil quality and land use; etc. The initial assessment, consultation and scoping stages identified these factors along with the implications of the predicted changes.

2.44 In order to evaluate environmental effects, assessment criteria were identified within each technical chapter of this ES. Thresholds of significance were then used to make explicit the conclusions of the assessment process, as far as is practicable.

2.45 For the purposes of environmental assessment, 'effects' are generally identified as being one of the following categories of significance:

- i. Not significant – no detectable or material change to a location, environment, species or sensitive receptor
- ii. Minor – a detectable but non-material change to a location, environment, species or sensitive receptor
- iii. Moderate – a material, but non-fundamental change to a location, environment, species or sensitive receptor

- iv. Major – a fundamental change to a location, environment, species or sensitive receptor.

2.46 Effects are considered to be significant for the purposes of the EIA Regulations where the effect is classified as being a ‘major’ or ‘moderate’ effect.

2.47 Some of the specific technical assessments adopt a variation of this approach, this is identified within the relevant chapter of the Environmental Statement together with the adopted criteria for assessing significance of effects. Each chapter also provides recommendations on what mitigation measures should be carried out to avoid, reduce or remedy significant adverse effects and what the likely residual effects will be.

Mitigation

2.48 Mitigation has been proposed as part of the iterative design process in order to accommodate and possibly avoid environmentally sensitive areas and other constraining factors as far as practicable and technically feasible. Where unavoidable the predicted effects were minimised and remediated by providing environmental mitigation measures, management and pollution control procedures which are based on the industry best practice and/or recommended by the statutory consultees on the EIA process.

2.49 Appropriate mitigation measures have been proposed in each technical assessment. As indicated previously, these measures have been largely integrated into the overall design strategy (embedded mitigation) rather than “added on” to the development post-design. By adopting a flexible and iterative approach to the design of the development, the applicant has been able to respond to the findings of consultation and environmental assessment work, and mitigate accordingly.

Cumulative Effects

2.50 In accordance with the EIA Regulations, the ES has given consideration to 'cumulative effects'. These are effects that result from incremental changes caused by past, present or

reasonably foreseeable actions together with the Development. For the cumulative assessment the combined effects of several developments that may on an individual basis be insignificant but, cumulatively with the proposed Development, have a significant effect, have been considered.

2.51 Renewable energy development schemes that have been considered in this ES include:

- i. Wear Point Wind Farm located c. 3.2km north of site (4 x 105m tall turbines);
- ii. Castle Pill Wind Farm located c. 4.2km north of site (3 x 76m tall turbines);
- iii. Lower Scoveston Farm located c. 4.7km north of site (5 x 75m tall turbine);
- iv. Pendine Parc Cynog Wind Farm located c. 34km east of the site (11 turbines between 69 and 80m tall).
- v. Dyffryn Brodyn Wind Farm located c. 39km north east of the site (10 turbines between 69 and 80m tall).
- vi. Blaen Bowi Wind Farm located c. 53km north east of the Site (3 turbines up to 70m tall).
- vii. Shipping Hill Wind Farm located c. 25km north east of the Site (2 turbines up to 60m tall).
- viii. Princes Gate Spring Water wind turbines located c. 28km north east of the site (2 turbines up to 86m tall).
- ix. Hoplass Farm Photovoltaic Solar Park located south of site.
- x. Wogaston Photovoltaic Solar Farm located south of Site.

2.52 The locations of the above wind farms within 11km of the Site are shown on figure 5.14 contained within Volume II of this ES.

- 2.53 Chapter 5: Landscape and Visual of this ES considers above listed proposed, consented and built schemes with a likelihood of intervisibility with the Development and the resultant cumulative landscape and visual effects.
- 2.54 Chapter 7: Ecology also considers the cumulative impact of proposed, consented and built schemes within 15km of the proposed Development on avian interests.
- 2.55 Chapter 10: Noise also provided specific assessment of the effects associated with existing schemes. No cumulative noise effects from the operation of other commercial wind farms have been identified due to the distance to other consented and operational wind farms in the area.

Assumptions and Limitations

- 2.56 A number of assumptions have been made during preparation of the Environmental Statement, which are set out below. Assumptions specific to certain environmental aspects are discussed in the relevant chapters of the Environmental Statement.
- i. The principal land uses in the vicinity of the wind farm site remain as they were at the time of this Environmental Statement preparation, except in cases where planning permissions have already been granted. In these cases, it is assumed that the approved development (e.g., a new house) will take place.
 - ii. Information provided by third parties, including publicly available information and databases is correct at the time of publication.