Abergorki Wind Farm

Environmental Statement: Non-Technical Summary

Prepared by LUC for REG Windpower

June 2013
**Project Title:** Abergorki Wind Farm: Non-Technical Summary

**Client:** REG Windpower

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1 Introduction

1.1 REG Windpower is applying for planning permission to construct and operate a wind farm known as Abergorki Wind Farm, within the County Borough of Rhondda Cynon Taf. The location of the site of the proposed wind farm is shown in Figure 1.

1.2 In accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999\(^1\) (the EIA Regulations) the planning application must be accompanied by an Environmental Statement (ES), a document that describes the methods used and findings of a process known as environmental impact assessment. This non-technical summary (NTS) forms part of the Environmental Statement, and provides a summary of the ES and its conclusions in non-technical language.

1.3 The wind farm proposals have been developed taking into account discussions with a wide range of people, including local residents, the planning authority, statutory bodies such as Natural Resources Wales\(^2\), and other interested organisations. Public exhibitions local to the site and newsletters to local residents within the wards of Maerdy, Treorchy and Treherbert have been used as a means of ensuring the local community is informed about the proposals and given opportunities to discuss the project with members of the REG development team.

Environmental Impact Assessment

1.4 The purpose of environmental impact assessment, or EIA, is to identify potential significant environmental impacts of a proposed development. This is undertaken through establishing the existing characteristics of the area likely to be affected by the development, known as the baseline, and then predicting potential environmental impacts of the development, noting whether they are positive or negative.

1.5 Where possible impacts are avoided, or minimised through the use of mitigation - either by amendments made to the design of the development, or through the use of mitigation measures. The EIA process results in the identification of those residual environmental impacts that are judged to be significant i.e. those remaining following implementation of the mitigation measures.

1.6 The process undertaken, methods used and findings of the EIA are presented in a document called the Environmental Statement, or ES. The significant residual environment impacts identified will be used to assist Rhondda Cynon Taf County Borough Council in considering and determining the planning application for the Abergorki Wind Farm.

1.7 This non-technical summary has been produced to ensure that the EIA process undertaken and reported in the ES is summarised and understandable to all. A summary of the assessment methods used and findings on a topic by topic basis are described in Section 3.

Planning Policy

1.8 The proposed development is located within the County Borough of Rhondda Cynon Taf, and the Council is required to determine the planning application in accordance with their planning policies, unless other material considerations dictate otherwise.

1.9 The development plan, and therefore the planning policies, against which the application for Abergorki Farm will be considered is made up of:

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\(^1\) Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, SI No. 293 (as amended) (hereafter referred to as the EIA Regulations)

\(^2\) Including predecessor organisations: Countryside Council for Wales (CCW) and Environment Agency Wales (EAW)
• Rhondda Cynon Taf Local Development Plan up to 2021 (2011).
• Supplementary Planning Guidance: The Historic Built Environment (2011).

1.10 Other material considerations include the fifth edition of Planning Policy Wales, adopted in November 2012\(^3\), which contains the current land use planning policies for Wales and provides the policy framework for local planning authority plan preparation and decision making; the Overarching National Policy Statement for Energy\(^4\) (EN-1); and, the National Policy Statement for Renewable Energy Infrastructure\(^5\) (EN-3).

1.11 Planning Policy Wales is supplemented by a series of 21 topic based Technical Advice Notes (TANs). The most relevant TAN for Abergorki Wind Farm is TAN 8: Planning for Renewable Energy, which was adopted in 2005. TAN 8 identifies areas in Wales which are considered to be the most appropriate locations for large scale (over 25MW) wind farm development. These areas are known as Strategic Search Areas. The site of the proposed Abergorki Wind Farm is located within the boundary of Strategic Search Area F (Coed Morgannwg).

**About the Developer**

1.12 REG Windpower is one of the UK’s leading developer and operators of small to medium-sized wind farms. The company has the resources and expertise to develop, build and operate high quality, renewable energy schemes, and currently operates 12 onshore wind farms throughout the UK, with 57.15MW of operational capacity, and more than 900MW in development.

1.13 REG Windpower is owned by Renewable Energy Generation Ltd. As well as developing, building and operating wind farms, the group also generates renewable energy from used cooking oil through its subsidiary company REG Bio-Power.

1.14 REG Windpower identifies potential sites for onshore wind energy development via a criteria-based site selection approach. Key elements of the site search and selection processes are wind resource, access, grid connection, location of residential properties, and distance from statutory designations.

**Site Description and Location**

1.15 The site of the proposed Abergorki Wind Farm lies on Mynydd Maerdy. The wind farm is located on a plateau of high ground (approximately 450m above ordnance datum (AOD)) above the Rhondda Valleys. The site lies to the west of the village of Maerdy (in the Rhondda Fach valley) and to the north of Treorchy (Rhondda Fawr valley), and is currently used for rough sheep grazing.

1.16 The old Maerdy Coal Tip lies immediately to the east and north of the three turbines, through which the eastern access is located. A steep valley lies to the south and west of the site, with Tynewydd Forest approximately 1km further to the west.

1.17 Maerdy Wind Farm, consisting of eight turbines, is currently under construction adjacent to the site to the northwest. Pen y Cymoedd Wind Farm, a consented scheme of 76 turbines lies to the north and west of Maerdy Wind Farm, and the consented Mynydd Bwllfa Wind Farm (nine turbines) is also located to the north. An operational eight turbine wind farm called Ferndale Wind Farm lies to the south east.

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\(^3\) Welsh Government (November 2012) Planning Policy Wales, fifth edition
\(^4\) Department of Energy and Climate Change (July 2011) Overarching National Policy Statement for Energy (EN-1)
\(^5\) Department of Energy and Climate Change (July 2011) National Policy Statement for Renewable Energy Infrastructure (EN-3)
Scheme Description

1.18 The wind farm will involve the installation of three wind turbines together with associated infrastructure. The site layout is shown in Figure 2.

1.19 The maximum height to blade tip of each turbine will be 146.5m above existing ground level. Illustration 1 below shows the main components of a wind turbine. Table 1 contains the map grid references of the three turbines.

**Illustration 1: Main components of a wind turbine**

![Illustration of a wind turbine]

**Table 1: Grid References for the Three Proposed Turbines**

<table>
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<td>295786 199221</td>
</tr>
<tr>
<td>2</td>
<td>296002 199000</td>
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1.20 Infrastructure associated with the wind turbines includes:
- site access tracks;
- permanent crane hardstanding areas and external switchgear buildings for each turbine;
- a substation;
- underground onsite electrical cabling; and,
- creation of two temporary construction compounds.

1.21 For ease of reference, the term ‘Development Area’ is used to describe the area within which the main wind farm infrastructure will be constructed; only the site access routes extend beyond this area. The Development Area is illustrated on Figure 2.

1.22 Consent is being sought for up to a 25 year operating period. It is anticipated that the wind farm will take up to 15 months to construct. Onsite working hours will be 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays for any operations that give rise to noise audible at nearby noise sensitive locations.

**Site Access**

1.23 Two site access points have been included within the proposal in order to allow flexibility regarding the access route used. Both access points have been assessed as part of the scheme, to ensure that the worst case scenario has been taken into account. However, in practice, only one access will be constructed. Both access routes are shown on Figure 3.

1.24 Due to the size and/or weight of the turbine components, their delivery will comprise abnormal loads, which will be given a police escort to site. The route taken by these abnormal loads will depend on the access route selected, as described below.

**Eastern Site Access**

1.25 The proposed eastern access route runs from the public highway adjacent to the Avon Engineered Rubber Ltd factory at the northern extent of the village of Maerdy, through the former Maerdy Colliery site to the top of Mynydd Maerdy. In order to enable this access, the existing track through the former colliery site and bridge over the Nant y Calch will require upgrading.

1.26 The route taken by abnormal loads will be from the delivery port (most likely to be Swansea Docks) via the M4 motorway to the A470 at junction 32 and then on to the A4058 at Pontypridd, then on to the A4233 at Porth, and thereafter north on A4233 to Maerdy and the site.

**Western Site Access**

1.27 The proposed western access route leaves the public highway on the A4061 Rhigos Road north of Treherbert then follows the existing Forestry Commission Wales track to the boundary of the forest and private land used for upland sheep grazing at Tarren Eiddew (the location of the under construction Maerdy Wind Farm). From here, a new track will be created, meeting up with the new access tracks that join the turbine locations.

1.28 Abnormal loads will be routed to the Site from the delivery port (most likely to be Swansea Docks) via the M4 motorway to the Heads of the Valley’s Road (A465) at junction 43. From here to vehicles will turn on to the A4061 at Hirwaun, and thereafter south to the site access point.

**Micrositing**

1.29 It is possible that once planning permission is granted there may be a need to move the position of individual turbines or elements of the associated infrastructure. This may be required as a result of unexpected ground conditions, or to avoid currently unknown archaeological finds. As such, a micrositing allowance of 50m radius in any direction is proposed for the turbines, access tracks and other associated infrastructure as part of this planning permission.
1.30 The implications of moving the turbines or infrastructure by this distance have been assessed as part of the EIA, which in some cases has resulted in micrositing restrictions being identified, preventing such a movement in a certain direction for a particular turbine or scheme component.

**Connection to the National Grid**

1.31 The onsite substation is likely to be connected to the local electricity distribution network via the nearby Maerdy Substation. Initial correspondence from the local distribution network operator, Western Power Distribution, indicates that approximately 1.35km of 33kV overhead line and a short section of 33kV underground cable will be required. This connection is anticipated to run through the former Maerdy Colliery site. Following any grant of planning permission, REG will continue to consult with the local distribution network operator Western Power Distribution to agree the most appropriate connection point. The grid connection itself will be the subject of a separate application for consent made by Western Power Distribution.

**Scheme Design**

1.32 In accordance with best practice, environmental specialists were involved with the scheme design process from the outset. This ensured that environmental constraints were taken into account in identifying a site within a wider study area, and in defining the locations for the turbines, access tracks and other wind farm infrastructure. These environmental constraints included the location of peat, watercourses, public rights of way and the visual and potential noise impact of the turbines.

**Scheme Benefits**

1.33 Abergorki Wind Farm will have three turbines, each up to 3 Megawatts (MW) in size, with a maximum installed capacity of 9MW. These would generate an average of more than 27 million kWh (units) of renewable electricity per year, enough to meet the annual needs of over 6,300 households (based on local wind data, and equivalent number of households served based on Westminster Government (DECC) published figures for domestic electricity consumption in the UK in 2010)⁶.

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⁶ [http://abergorkiwindfarm.regwindpower.co.uk/proposal](http://abergorkiwindfarm.regwindpower.co.uk/proposal)
2 EIA Process

Scoping

2.1 To decide which aspects of the scheme are likely to give rise to environmental impacts, and to determine the work needing to be undertaken for the ES, a Scoping Report was prepared by LUC on behalf of REG. This Scoping Report set out the potential environmental impacts that could result from a wind farm development at the Abergorki site, and the assessment process by which these issues were to be evaluated. Methodologies for the assessments were also presented. The Scoping Report was submitted to Rhondda Cynon Taf County Borough Council in January 2013, who then consulted with various teams within the Council and statutory consultees to agree what the EIA will cover and how, prior to carrying the assessment out. A Scoping Opinion detailing the results of the consultation was issued by the Borough Council in March 2013.

2.2 Through the scoping process, it was judged that the proposed Abergorki Wind Farm would be unlikely to result in significant impacts on a number of environmental topics listed in the EIA Regulations, therefore these have been ‘scoped out’ of the EIA. The potential impacts scoped out are impacts on: shadow flicker, vibration, and forestry impacts during construction / decommissioning.

Grid Connection

2.3 In line with national guidance\(^7\), the potential for significant environmental impacts arising as a result of the grid connection have been considered, based on the most likely grid connection route (as described above in Section 1).

2.4 Given the expected route of the grid connection through the former Maerdy Colliery site via overhead line and a short section underground cable, the minimal ground disturbance required and the temporary and progressive nature of the construction works, it is not considered that connection of the wind farm to the grid would give rise to significant environmental impacts. As such, a detailed assessment of the environmental impacts of the grid connection has been scoped out of the EIA.

Significant Impacts

2.5 The focus of an EIA should be on the significant environmental impacts. Whilst the Environmental Statement should provide a full factual description of the proposed wind farm development, the emphasis should be on the ‘main’ or ‘significant’ environmental impacts. The judgement on what is a ‘significant’ environmental impact is crucial in informing the decision-making process. However, defining what is significant is not a simple task.

2.6 For each environmental topic, a definition has been provided for what the author has defined as a significant impact. Where available, these reflect recognised best practice and guidelines. The significance of likely impacts occurring as a result of the wind farm has been categorised, wherever possible, as major, moderate, minor or negligible. Impacts categorised as major or moderate are considered to be ‘significant’ as highlighted in the EIA Regulations.

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\(^7\) Planning Policy Wales and The Overarching National Policy Statement for Energy (EN-1)
Cumulative Impacts

2.7 In addition to the potential environmental impacts of Abergorki Wind Farm, it is important to consider the possible impacts that the proposed wind farm may have in combination with existing or consented wind farms, and where possible, other wind farms for which an application has been submitted. The EIA Regulations state that types of impact identified “should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects.”

2.8 A list and map of other wind farms within 35km of the proposed Abergorki Wind Farm was sent to Rhondda Cynon Taf County Borough Council and all other relevant authorities. This information was updated as a result of correspondence received from the Borough Council and other consultees, with the final list guiding the consideration of cumulative impacts.

2.9 The study area for cumulative impacts is specific to the environmental topic. For example, the potential for cumulative noise impacts will be localised in comparison to potential cumulative landscape or visual impacts. As such, the study area and other wind farms taken into account within the assessment of cumulative impacts were defined on a topic by topic basis.

Consultation

2.10 Meetings and other consultations were carried out with a number of statutory and non-statutory consultees during the EIA process. The purpose of these consultations to provide progress updates on the environmental assessments being undertaken, to enable any potential issues or concerns to be discussed at an early stage, and to ensure that the assessment process was transparent. Such discussions also fed into the design of the wind farm, ensuring that potential issues could be taken into account at an early stage.

2.11 In order to inform and gather the opinions of the local community and other interested parties on the proposed wind farm development, REG issued a newsletter to local residents to introduce the proposals for a wind farm in November 2012, which was followed by an initial public exhibition in December 2012. The exhibition presented an opportunity for local people to discuss the project with members of the REG development team, as well as view visualisations demonstrating how the wind farm will appear.

2.12 A further public consultation was undertaken in the form of a two day public exhibition hosted at three locations close to the site in May 2013. The exhibition comprised a number of boards containing information on site selection, consultation, and surveys undertaken; plans, photographs and visualisations; and, community benefit information.

EIA Team

2.13 The Environmental Statement has been compiled by LUC on behalf of REG. LUC had overall responsibility for the ES, and prepared the introductory chapters, and a number of topic specific chapters of the ES (planning policy; landscape and visual amenity impacts; telecommunications, television, and aviation; and socio-economic impacts). Sub-consultants, each a specialist in their field, undertook specialist assessments where necessary. The remaining assessments were undertaken by:

- NA Brown Engineering Geologist (ground conditions to inform the scheme design).
- SLR Consulting (geology and hydrology; traffic and transport; air quality).
- Avian Ecology (avian and non-avian ecology).
- Hoare Lea Acoustics (noise).
- Oxford Archaeological Associates (cultural heritage).
- Pager Power (telecommunications).
- Turley Associates (carbon balance).
3 EIA Findings

Ground Conditions and Hydrology

3.1 The western part of the Site and the proposed western access route are located within the Afon Rhondda Fawr catchment, while the eastern construction compound and proposed eastern access route are located within the Afon Rhondda Fach catchment.

3.2 The majority of the Development Area (shown on Figure 2) and the western access track are located within the Nant Orci sub-catchment of the Afon Rhondda Fawr. The Nant Orci originates from springs located just to the north of the Site boundary, and flows in a southerly direction to the south of the Site boundary through the Cwm Orci valley, before entering the Afon Rhondda Fawr.

3.3 Wind farm construction and operation can have potential direct impacts on groundwater and surface water flow and quality e.g. modifications to local surface drainage patterns and flow, reduction of groundwater recharge, accidental pollution incidents, increased erosion and sedimentation. Indirect impacts on flooding and water quality include changes to flow regimes and water quality within the Afon Rhondda Fach and Afon Rhondda Fawr catchments downstream of the Site, and damage to peat as a result of drainage leading to peat drying out.

3.4 The scheme design has been modified to ensure that the scheme infrastructure, including the wind turbines, are located at least 20m from any of the surface water drainage features, such as seasonal drainage ditches. The access track between the turbines has been located so that it does not cross any seasonal or permanent drainage channels; watercourse crossings will be required along the western or eastern access route. Peat depth across the site guided the location of the turbines and other scheme infrastructure to minimising the potential impact on peat; this included moving Turbine 2 to avoid the deepest peat.

3.5 The Environmental Statement concludes that potentially moderate adverse pre-mitigation impacts could occur in relation to surface water and groundwater quality, flooding, and surface water and groundwater resources. However, by following Pollution Prevention Guidelines, best practice guidance and other mitigation measures during construction and operation, it is expected that all potential impacts can be mitigated.

Summary

All residual impacts are judged to be of negligible significance following incorporation of proposed mitigation measures, including adoption of Sustainable Drainage Systems, Pollution Incident Response Plan, Construction Method Statement and Environment Management Monitoring Plan.

Avian Ecology

3.6 Survey work to establish the use of the site and surrounding area by birds was undertaken, these included a survey of habitats on site, winter walkover surveys, breeding bird surveys and vantage point surveys. The information on birds flying above the Development Area collected during the vantage point surveys is used to assess the potential for birds to collide with the wind turbines during operation. A desk-based study was also used to identify any statutory or non-statutory protected sites in the area, which have been designated for their avian (bird) interest.

3.7 The key issues for birds in relation to wind farm developments are direct and indirect impacts of construction relating to habitat loss or displacement. These impacts are considered in relation to individual bird species, as well as statutory and non-statutory sites with designated bird interest.
While there are no bird related statutory designated sites (i.e. Special Protection Areas, or Sites of Special Scientific Interest) within 10km of the site, the site does lie within a non-statutory Site of Importance for Nature Conservation (Treorchy Slopes), designated for its population of skylark, meadow pipit, stonechat, whinchat, wheatear, reed bunting, tree pipit, merlin, snipe and jack snipe. There are also four other Sites of Importance for Nature Conservation within 2km of the site.

3.8 The layout of turbines, construction compounds and access tracks have been carefully designed to avoid causing more disturbance than necessary to valuable biodiversity features in and around the Site. Habitats within the Development Area were generally considered of low value for birds, therefore no specific bird related design modifications were considered necessary.

3.9 To avoid potential disturbance to Schedule 1 birds species, all areas within 500m of construction and decommissioning works will be surveyed in advance of any works required during the breeding season (March to August) to identify nesting locations for specially protected species. Appropriate works exclusion zones would then be established around these nest sites in line with best practice guidance for the species involved.

3.10 To avoid impacts upon other nesting birds, any habitat clearance will be undertaken outside the breeding bird season (April to August inclusive), or otherwise under the supervision of a suitable qualified ecologist. Construction and decommissioning impacts on birds will be minor adverse to negligible and therefore not significant in EIA terms.

3.11 Operational wind turbines may impact on some bird species, either through displacement or collision with the wind turbine blades. These effects vary between species, with collision generally considered likely to affect large or soaring birds (such as larger raptors and wildfowl), and displacement likely to affect ground nesting species, such as some waders. The assessment considered the potential for these impacts to affect different bird species.

3.12 An assessment of collision risk for peregrine was undertaken because of the number and height of flights recorded during the vantage point surveys. It was not necessary to undertake a collision risk assessment for any other bird species. The assessment concluded that operation of the wind farm will result in impacts that are minor adverse or negligible and therefore not significant in EIA terms.

3.13 In addition to looking at the impacts of Abergorki Wind Farm on birds in isolation, the assessment also concluded that there would be a negligible cumulative impact on raptors and wading bird species from all wind farms within 5km.

Summary

No significant impacts are predicted on Avian Ecology interests as a result of construction, operation or decommissioning of Abergorki Wind Farm.

Non-Avian Ecology

3.14 Ecological surveys were undertaken to assess the impact of the proposed wind farm on important habitats and species. A desk study identified three statutory designated sites (SSSIs) within 5km of the site; however, all are designated on the basis of habitats and lie over 2.8km away, therefore no direct or indirect impacts on statutory designated sites will occur.

3.15 The Abergorki Wind Farm turbines have been designed to maintain a buffer of at least 50m between the blade tip and the nearest suitable bat habitat feature. The layout of turbines and other scheme infrastructure has also been carefully designed to avoid the areas of deepest peat and the associated blanket bog vegetation community; a number of peat depth surveys were undertaken and the infrastructure layout underwent a series of amendments to achieve this, informed by discussions with regulatory bodies and members of the Hydrology team. Culverts are to be instated where the internal access track crosses streams in order to minimise direct impacts upon watercourses.
3.16 Construction related impacts on non-statutory designated sites, blanket bog and valley mire habitats and the associated peat resource have been minimised and/or entirely avoided through the careful design and siting of the layout components of the Scheme. Habitat enhancement (informed by a detailed Habitat Management Plan) will mitigate the loss of a small area of blanket bog and peat and include the additional enhancement of habitats. Targeted areas within the Site will be managed to aid the restoration of active blanket bog on the hill top and to promote dry heath on the hill slopes. As a result of the minimised impact and proposed habitat management and enhancement, there will be a residual minor to moderate beneficial impact on habitats.

3.17 Operational impacts of the wind farm relate to the actual operation of the wind turbines themselves and the upkeep and maintenance of the wind turbines and associated infrastructure. Maintenance of the wind farm is not expected to have an adverse impact upon most species and all site habitats. A detailed assessment of potential impacts of the operating wind farm on bats was undertaken, which can be affected by collision with the turbine blades or due to damage to bat’s lungs caused by a sudden change in air pressure (barotrauma). A negligible to minor adverse impact on bats was identified overall.

Summary
No significant impacts are predicted in relation to ecological interests as a result of construction, operation or decommissioning of Abergorki Wind Farm. Habitat management and enhancement measures will result in a minor to moderate beneficial residual impact.

Traffic and Transportation

3.18 Two site access points have been included within the proposed Abergorki Wind Farm scheme in order to allow flexibility regarding the access route used: a western access, via the A4061 Rhigos Road and the existing forestry access currently being used to construct Maerdy Wind Farm; and an eastern access, via the A4058 and A4233 to access the site via a former colliery site located north of the village of Maerdy. In practice, only one access will be constructed, however to ensure that the worst case scenario has been considered, the assessment of transportation impacts has been carried out for both access routes.

3.19 The final access route constructed will be used for the delivery of abnormal loads e.g. the turbine components, together with conventional heavy goods vehicles and other traffic importing other construction materials to the site.

3.20 Key issues considered in relation to traffic and transportation are direct impacts of wind farm construction on the layout of the existing road infrastructure (for example the turning space needed for abnormal loads), and on adjacent amenities and other road users e.g. the impacts on road traffic accident levels. There may also be indirect impacts of wind farm construction on residences and other road users, for example, an increase in traffic leading to community severance.

3.21 Feasibility and engineering assessments were undertaken to identify the route that abnormal loads will use to get to site, and the location and design of the western and eastern tracks providing access from the public highway to the Development Area.

3.22 The pre-mitigation impacts identified by the assessment of the western access route is minor adverse for noise and vibration, driver severance and delay, road safety, and hazardous and dangerous loads. The following mitigation measures will be adopted under the western access option:

- Traffic Management Plan for the movement of abnormal loads;
- Trial run for abnormal loads prior to commencement;
- Road condition survey (including assessment of existing structures as appropriate) prior to the construction period and a similar assessment following completion of the works; and

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3.23 The pre-mitigation impacts identified by the assessment of the eastern route are minor adverse for driver severance and delay, community severance and delay, vulnerable road users, road safety, and hazardous and dangerous loads. Also predicted are major adverse impacts over short periods on community severance and delay (3 days) and hazardous and dangerous loads (21 days), as well as a moderate adverse impact on vulnerable road users during the peak month, and on the three concrete pour days.

3.24 The following mitigation measures will be implemented under the eastern access option:

- Traffic Management Plan for the movement of abnormal loads;
- Offsite road improvements:
  - Link from Wigant Place to Avon Factory Access Road;
  - Temporary removal of street furniture and bridge parapets and construction of vehicle over-run areas over footways and verges;
  - Temporary parking restrictions;
- Campaign of provision of information to local residents and users of amenities, to involve the community in the safe operation of the Traffic Management Plan and to alleviate stress and anxiety;
- Trial run for abnormal loads prior to commencement; and
- Road condition survey prior to the construction period and a similar assessment following completion of the works.

3.25 After mitigation, the majority of residual impacts of the Abergorki Wind Farm on traffic and transportation are not expected to be significant, with the exception of the eastern access option which will have temporary moderate adverse impacts on community severance and delay (3 days), and vulnerable road users (1 month) during construction.

3.26 During operation of the wind farm, it is unlikely that more than five vehicles will access the site on any one day and on most days there will be no wind farm traffic at all. Vehicle movements such as this will be indistinguishable from normal daily traffic and will have no impact.

**Summary**

No residual impacts are judged to be significant following incorporation of proposed mitigation measures; with the exception of the eastern access option which will have temporary moderate adverse impacts on community severance and delay (3 days), and vulnerable road users (1 month) during construction. There will be no operational impacts.

**Noise**

3.27 Wind farms can result in construction and operational noise impacts on the residents of nearby dwellings. In addition, the noise assessment considered the potential cumulative impact of the operation of Abergorki Wind Farm alongside other adjacent consented wind farms: Maerdy Wind Farm, Pen y Cymoedd Wind Farm and Mynydd Bwllfa Wind Farm.

3.28 The layout of the wind farm has been iteratively developed to achieve an acceptable noise impact on local residential amenity, whilst maintaining the generation capacity of the development. Noise emission levels were calculated for the original outline scheme configuration and compared against noise standards limits. When non-compliance was predicted, layout design advice was provided to the design team, and this information was used to adjust the turbine positioning in order to reduce noise impacts. As a result noise impacts associated with the operation of the wind farm are considered to be acceptable and therefore not significant.
3.29 Negligible to minor adverse pre-mitigation noise impacts are identified during construction. To reduce the potential effects of construction noise, a number of mitigation measures were identified including restricted working hours for certain activities, adherence to good practice guidelines related to construction and the use of equipment.

3.30 After mitigation, all impacts from the Abergorki Wind Farm, during construction, operation, and decommissioning are expected to be ‘not significant’.

**Summary**

No significant noise impacts are predicted as a result of the construction, operation or decommissioning of Abergorki Wind Farm.

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**Cultural Heritage**

3.31 There are no known heritage assets within the Abergorki Wind Farm site itself; the nearest known feature of archaeological interest that could be directly affected by the wind farm is a traditional dry stone wall south of the western access route. In addition to impacts on known heritage assets, the overall potential for currently unknown archaeological remains to exist within the site and therefore be impacted by the wind farm has also been considered, although the potential is judged to be low. The most likely categories of unknown archaeology that could be present are burial cairns of the Bronze Age, post-Medieval agricultural remains (e.g. traces of sheepfolds) and recent industrial remains. There is also some potential for the survival of archaeologically relevant organic materials (e.g. wood and other plant remains), or artefacts made of such materials (such as a recent find in the neighbouring Maerdy Wind Farm site).

3.32 The archaeological value of peat resources within the site has helped guide the scheme design. Peat may itself contain a record of past environments (pollen and other plant remains) relevant to archaeological sites and, particularly when permanently waterlogged, it may also help to preserve organic artefacts. Where practicable, important archaeological remains uncovered during construction will be avoided through micrositing.

3.33 Whilst the archaeological potential of the Abergorki site is low, there is still a need to mitigate any direct impacts during construction through a scheme of archaeological works, which will involve the presence of professional archaeologists during groundwork operations, backed by provisions for contingent excavation should important remains be encountered; the scheme will include the full range of assessment, analysis and publication provisions appropriate under professional standards. Following this mitigation, the residual direct impact of construction of the wind farm is judged to be none to negligible.

3.34 For the consideration of indirect impacts on the setting of heritage assets during operation of the wind farm, a Study Area of 5km from the centre of the Abergorki Wind Farm site was used. Within this 19 Scheduled Monuments (including a large number of Bronze Age burial cairns), six Grade II* and 14 Grade II Listed Buildings (mostly dating from the industrial periods of the nineteenth and twentieth centuries), and two Conservation Areas were identified. Some non-designated assets of local interest were also considered.

3.35 The operation of Abergorki Wind Farm is judged to have an indirect Minor/Moderate impact on the setting of Park & Dare Institute & Hall (a Grade II* Listed Building in Treorchy), and a low Major impact on an associated group of assets with a ‘Defence & Control’ theme (Mynydd Maendy Iron Age Hillfort, Twyn y Bridallt Roman Camp and Castell Nos Medieval Motte & Bailey), as well as minor impacts on five other heritage assets.
Landscape and Visual

3.36 A 35km study area was identified for the Landscape and Visual Assessment, which contains a mixture of landscapes. The character of the study area is defined by the grazed rough grasslands of the upland valleys and mining settlements in the valley floors including Merthyr Tydfil, Porth and Pontypridd, Bridgend and Neath. The Brecon Beacons National Park lies in the north of the study area.

3.37 Eight turbines of the Maerdy Wind Farm (under construction) are located immediately adjacent to the Abergorki Wind Farm site to the north. The operational Ferndale Wind Farm lies 2.8km to the southeast of the nearest Abergorki Wind Farm turbine. Other operational wind farms in the Landscape and Visual Assessment study area are: Ffynnon Oer to the west (approx. 10.7km), Taff Ely to the south (approx. 12km distant), Maesywen to the northwest (approx. 12.8km distant) and Mynydd Portref (approximately 13.1km south). These wind farms are considered as part of the baseline against which the landscape and visual impacts of Abergorki Wind Farm have been assessed.

3.38 The layout of turbines within the site was refined with input from the landscape and visual team. This aimed to achieve a balanced scheme that would be perceived as an extension to the adjacent under construction Maerdy Wind Farm. The visibility of the turbines from nearby settlements was a key consideration. Here visibility is limited by the steep valley sides and the turbines were set back as far from the edge as possible to limit the extent of visibility from within the valleys. A minimum distance of 725m from any property was maintained. Visibility from the two nearest properties in Fforch Orky was of particular consideration – and the turbines were sited to achieve a balanced composition in these views.

3.39 During construction, the landscape and visual impact assessment identifies a significant (moderate) impact on the landscape character of the site, and identifies some significant impacts on views. The main impact that will affect views is the construction of the turbines themselves. This impact will develop over time until it reaches that set out in the section on operational impacts. However, traffic movements to and from site entrances will affect the local community of Maerdy should the eastern access be used (moderate significance of impact), and walkers across the open access land on Mynydd Maerdy in the case of either access being used (major significance of impact).

3.40 During operation, impact on the landscape character has been minimised by ensuring the three wind turbines form a balanced group in relation to the ridgeline plateau of Mynydd Maerdy and appear as an extension to Maerdy Wind Farm (under construction). Almost all views of Abergorki’s three turbines will be seen in the context of the adjacent Maerdy Wind Farm (under construction), with the exception of views from Fforch Orky.

3.41 In terms of impacts on the Brecon Beacons National Park, the landscape and visual impact assessment considers that none of the special qualities of the National Park will be affected by the proposed scheme. The landscape and visual impact assessment also considers that the majority of the special qualities of the Cwm Orci Special Landscape Area will not be affected by the presence of Abergorki Wind Farm, though there will be some direct impacts to the Special Landscape Area including localised loss of landscape elements and prominent views of turbines in and around the Special Landscape Area. It also considers that the integrity of the Rhonda Fawr Northern Cwm and Slopes Special Landscape Area and the Hirwaun Common, Cwm Dare & Cwm Aman Special Landscape Area will not be affected by the wind farm.
Only one significant cumulative impact has been identified – on viewpoint 7 from Bwlch y Clawdd – which records a moderate impact due to the incremental cumulative impact as Abergorki extends views of turbines in addition to the consented Pen y Cymoedd and Mynydd Bwllfa wind farm schemes, at the high sensitivity promoted viewpoint.

The residential visual amenity assessment concludes that there will be a significant (major) visual change for one property, Fforch-Orky Farm due to the relative proximity of the views of turbines on the hill above the property, direct views from the garden and driveway and potential indirect views from inside the property (which may be filtered by screening from vegetation in the garden or farm buildings in the grounds). This is a worst case judgement that assumes there is no screening from vegetation. Fforch Isaf, which has primary views south down the Cwm Orci valley and therefore turbines will not be visible in direct views from the property or from primary outlooks, will experience a moderate visual change. Nine properties in Fforch Close, Treorchy, also will experience a moderate visual change, though have more distant views from rear windows and gardens which will be partially screened by vegetation.

### Summary

Major adverse residual impacts are identified on views and visual amenity for walkers using the open access land around Mynydd Maerdy during construction (short-term), and on viewpoint 1 at Fforch Orky during operation (long-term, reversible). The residential visual amenity assessment concludes that there will be a significant (major) visual change for one property, Fforch-Orky Farm.

Moderate adverse impacts are identified on landscape character and views during construction, and on two viewpoints during operation. A moderate adverse cumulative impact has been identified at one further viewpoint, with ten properties experiencing a moderate visual change in relation to residential visual amenity. Abergorki Wind Farm has been designed to appear as a balanced composition in the landscape and with the adjacent

### Telecommunications, Television and Aviation

The potential impacts of the wind farm on telecommunications, television and aviation interests were assessed.

The construction and operation of wind turbines has the potential to impact on wireless communications links or domestic television broadcast reception through interference with the electromagnetic waves used to transmit signals. A telecommunications link has been identified crossing through the wind farm site and potential impacts upon this link have been eliminated through the design of the wind farm layout.

Switchover to digital television has occurred in the area and digital television signals are less likely than analogue signals to be subject to interference effects from a wind farm. However, it is difficult to predict with certainty the likelihood or magnitude of any impacts on television reception before installation of a wind farm, therefore REG Windpower is committed to investigating and mitigating any television reception issues should a complaint be made once the turbines are installed. This can be secured through a planning condition imposed on the planning permission, or through a legal agreement between REG Windpower and the Council.

Wind farms have the potential to impact on the navigation and radar systems used by civilian and military aviation interests. The closest airport to the proposed Abergorki Wind Farm site is Cardiff Airport, approximately 32km to the south. Other airports within South Wales include Swansea Airport (approximately 40km to the west) and Pembrey Airport (approximately 55km to the west), while Bristol Airport is approximately 60km to the south east. There are no independent aerodromes within Rhondda Cynon Taf or within 10km of the proposed wind farm site. The MoD has a Royal Air Force Station at St Athan, in the Vale of Glamorgan (approximately 30km to the south). Consultation responses were received from the CAA and NATS which confirmed that they are no longer engaging in pre-application consultation regarding wind farm proposals. From recent experience of similar projects, this is also true of the MoD. In the absence of a response
from the MoD or CAA, the application for the adjacent Maerdy Wind Farm (under construction) was reviewed. Neither the MoD nor CAA objected to this wind farm, therefore it is not anticipated that there will be an objection to the proposed Abergorki Wind Farm.

### Summary

No significant impacts are predicted on television reception, telecommunications or aviation interests.

## Socio-Economic

3.48 The socio-economic assessment considered the potential impact of the proposed wind farm development on employment generation, recreation, tourism and public safety.

3.49 The assessment predicts that there will be minor positive impacts on the local economy in relation to employment generation during construction and operation. There will be an average of 15 construction workers on site throughout the 15 month construction period and once operational, regular routine inspection and maintenance visits will be required for the duration of its operational life. It is also likely there will be local employment generated as an indirect result of the construction of the proposed wind farm. Indirect employment could include supply chain spin-offs for local businesses, sub-contractor work relating to the transportation of labour and materials, and expenditure by construction employees in the local economy.

3.50 The wind farm site is designated as Open Access Land. There are also five footpaths within the site. The western access route will cross three footpaths and the eastern route will cross one footpath. Whilst other public rights of way (PRoW) lie within and close to the site, none are directly affected by the scheme. No PRoW will need to be diverted or temporarily closed. An Access Management Plan will be prepared and implemented to ensure the protection of the recreational users of the site during construction and as such the impact is judged to be of minor negative significance. If the eastern access track is selected, this will involve the upgrade of the access track through the former Maerdy colliery and coal tip, including provision of a new bridge. REG Windpower will also work proactively with the Council to assist with their aspirations to improve access and public recreation within the Former Maerdy Colliery Site. This will lead to a positive impact of moderate significance (if the eastern access route is selected) in relation to the improved access provision in the area. If the western access route is selected there will be a negligible impact on public access and recreation during operation.

3.51 The Environmental Statement concludes, from a review of existing tourism surveys, there is no strong evidence that tourists will be deterred visiting an area due to the presence of a wind farm. The proposed Abergorki Wind Farm will also involve the construction of three turbines in an area where turbines have already been consented. The addition of these three turbines is therefore highly unlikely to detract tourists from visiting the area, as there will already be existing wind farms present in the landscape. Impacts on tourism due to the operation of the wind farm are therefore considered to be of negligible significance.

3.52 In relation to public safety, the residual impacts during construction and operation are concluded to be of negligible significance. Under the Construction (Design and Management) Regulations 2007, site specific safety and emergency procedures will be prepared as part of the Construction Management Plan. During operation, wind turbines are designed to operate at a high standard of safety and are equipped with a number of safety devices. REG Windpower is an experienced wind farm operator and will adhere to the highest standards of operation.
The Abergorki Wind Farm site is an upland hill top currently used by grazing livestock and as such its existing carbon emissions will be very low. The underlying peatland does provide an existing carbon fixing source and also a store of carbon within its organic matter. A desk-based study and series of surveys were undertaken to provide an accurate assessment of the extent and depths of peat within the study area. The results of field surveys established the presence of shallow peats across the majority of the hill top and a deeper peat bowl to the north. In addition, a bowl of peat more than 3m deep was identified within the landownership covering the existing Maerdy Wind Farm.

Following the completion of the peat depth surveys, the wind farm layout and access tracks were redesigned, as far as possible, to avoid deeper peat deposits and minimise any impacts on the remaining shallower peats and watercourses.

The assessment of the carbon emissions impact of the proposed wind farm considered the emissions arising from the production, transportation, construction, operation and decommissioning of the wind farm including the impacts arising from construction on peatlands. It also considers operational carbon savings arising from the estimated renewable energy generation from the wind farm.

The wind farm is assessed as resulting in some losses of carbon from construction associated primarily with turbine manufacture, construction & decommissioning but also impacts on peatlands including reduced carbon fixing potential and losses from soil organic matter. The design and layout of the wind farm has aimed to reduce the impacts on deeper peatlands where possible through measures including careful consideration of the siting of turbines and infrastructure.

The expected net amount of carbon lost as a result of the wind farm development is 9,106 tonnes (with a range of between 4,449 tonnes to 17,745 tonnes). Carbon gains due to improvement of the site as a result of the Habitat Management Plan will further reduce the estimated carbon losses.

The expected payback time for the initial carbon losses during production, construction and decommissioning, after scheme design modification to avoid impact on peatlands and assuming the fossil-fuel mix, is 0.6 years, with a minimum and maximum range between 0.2 and 2.4 years and is therefore judged to be a negative impact which is not significant in EIA terms.

The expected average amount of carbon saved annually as a result of the wind farm displacing electricity from a fossil-fuel mix when in operation is 14,164 tonnes per year (ranging from 7,490 tonnes per year to 20,310 tonnes per year). The operational emission savings are considered overall to result in a significant positive impact in terms of the overall carbon balance.
Air Quality

3.60 Two site access points have been included within the proposal in order to allow flexibility regarding the access route used. Unlike the western access route, access to the site from the east would require construction traffic to pass through an Air Quality Management Area; therefore, it was considered necessary to undertake an air quality assessment.

3.61 In response to breaches of the Air Quality Objectives for Nitrogen Dioxide, Rhondda Cynon Taf County Borough Council has declared thirteen Air Quality Management Areas. Of these Areas, only the Ferndale Air Quality Management Area has the potential to be impacted significantly by the construction trips associated with the development scheme as the other Areas are either not on the route to site or are very remote.

3.62 Construction of the wind farm itself is unlikely to cause any significant air quality effects onsite, however the traffic movements associated with the construction phase have the potential to result in a direct, short-term impact at receptors close to the road network used by the vehicles, especially during the peak days of construction traffic, during the concrete pour for the turbine bases.

3.63 Guidance set out in the Design Manual for Roads and Bridges sets the criteria for when a detailed assessment of air quality is required. This focuses on roads with relatively high changes in flows or a high proportion of heavy goods vehicles. On this basis, there are no road links which can be regarded as 'affected roads' in terms of the Design Manual for Roads and Bridges screening criteria. This is particularly the case since the increase in heavy goods vehicles will only be over a period of 3 days, with the average increase over the entire (up to 15 months) construction period predicted to be less than 20 heavy goods vehicle movements per day.

3.64 The impact of the scheme can therefore be considered to be 'neutral' in terms of local air quality and no further air quality assessment is required. The impact of the scheme on annual average levels of pollutants is therefore regarded as 'insignificant' using the Design Manual for Roads and Bridges screening guidance.

Summary

No significant impacts are predicted on air quality, including the Air Quality Management Area at Ferndale.

Summary and Conclusions

3.65 The EIA found that, with the proposed mitigation measures in place, many potential environmental impacts associated with the construction and operation of the wind farm can be avoided or minimised. Also highlighted are the benefits of a detailed design process that seeks to minimise potential impacts through making modifications to the scheme design.

3.66 The EIA concludes that significant adverse residual impacts will occur in relation to:

- community severance and delay for three days whilst the turbine foundation concrete pour is occurring, and vulnerable road users for a period of one month during construction, in relation to traffic and transportation of the eastern access option;
- indirect setting effect on Park & Dare Institute & Hall, Treorchy during operation;
- construction impacts on landscape character (moderate adverse, short-term) and views (moderate or major adverse, short term impacts);
- operational impacts on 3 viewpoints (1: Fforch Orky, 2: Car park off the A4233 and 4: Treorchy Station) ranging from major to moderate long term, reversible levels of significance; and,
- cumulative impacts of moderate, long term, reversible significance on promoted viewpoint (7) at Bwlch y Clawdd.
3.67 In addition a low Major (low in the range of ‘material but less than substantial harm’) indirect setting effects during operation will occur in relation to an Associated Group of Assets with a ‘Defence & Control’ theme.

3.68 No significant adverse residual impacts are predicted to occur in relation to all other EIA topics: ground conditions and hydrology; avian ecology; non-avian ecology; traffic and transportation – western access option; noise; telecommunications, television and aviation; socio-economics; carbon balance; and air quality.

3.69 A significant positive impact is predicted to occur in relation to carbon emission savings. In relation to non-avian ecology, minor to moderate beneficial impacts are predicted to occur in relation to non-statutory designated sites and habitats, and peat. While, moderate positive impacts are predicted to occur for public access and recreation during operation (if the eastern access is used). Other minor positive benefits are predicted to occur in relation to direct and indirect employment generation during construction and operation of the wind farm.
Figure 3

Legend
- Site Boundary
- Turbine Locations
- Access Tracks, Turning Heads and Passing Places
- Construction Compounds
- Crane Pads
- Substation

Drawing: 5624_035_Fig_2-2_Site_Boundary  30/07/2013

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