Aviva Wind Turbine

Environmental Statement

Volume 1 – Non-Technical Summary

September 2018

Prepared for Aviva plc by Purple Renewables

FOREWORD

This document is Volume 1 of the Environmental Statement (ES) for the proposed Aviva Wind Turbine. The ES has been prepared by Purple Renewables to accompany an application for planning permission submitted to Perth and Kinross Council.

Inspection of the planning application, Environmental Statement and Supporting Documents

Copies of the Environmental Statement may be inspected free of charge at the following location:

Perth and Kinross Council
Pullar House
Kinnoull Street
Perth
PH1 5GD

Digital copies of the Non-Technical Summary are available free of charge from Perth and Kinross Councils Planning Portal or from www.aviva-renewables.co.uk

Further hard copies of the Environmental Statement are available at a cost of £400.

DVD copies are also available at a cost of £25.

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1. Introduction

1.1.1 This Non-Technical Summary (NTS) forms part of the Environmental Statement (ES) which has been prepared to accompany the submission of a planning application under the Town and Country Planning (Scotland) Act 1997, as amended to Perth and Kinross Council for planning permission to construct a wind turbine at Aviva, Pitheavlis, Perth.

Project Description

1.1.2 The planning application is for a single wind turbine up to 77 metres (m) tip height with associated infrastructure such as a crane hardstanding, upgraded access track, and a temporary construction compound. The candidate turbine is between 800 and 900 kilowatts (kW) capacity. Full details of the proposed development are provided in Chapter 2, Volume 2 of the ES. The proposed layout is presented in Figure 3, Volume 3 of the ES and displayed at the back of this document.

Aviva

1.1.3 Aviva plc is a British multinational insurance company, with approximately 33 million customers across 16 countries. In the UK, Aviva is the largest general insurer and a leading life and pensions provider.

1.1.4 Aviva own and currently operate from the former General Accident Headquarters in Pitheavlis, Perth. This site has approximately 1200 employees working across a range of departments in the company.

1.1.5 Aviva take climate change very seriously, it's impact on air quality, weather events and flooding, and its impact on people. Aviva want to do all they can to try to reduce global greenhouse gas emissions. Aviva began purchasing electricity from renewable sources for their UK estates in 2004 and they have reduced their worldwide carbon emissions by 53% since 2010. Aviva strongly believe that where it is feasible to produce green energy on their own sites they should be reinvesting to make the business as economically and environmentally sustainable as possible for the future.

1.1.6 Aviva would like to make their Perth site 100% supplied by on-site renewable generation and would like to make their Perth site an exemplar site for the Aviva Group worldwide.

2. Environmental Impact Assessment (EIA)

2.1.1 The purpose of an EIA is to inform the decisions maker of the environmental impacts of a proposed development, both positive and negative. Throughout the process information is collected about the possible environmental effects which is evaluated and presented in a transparent manner to enable decision makers to take account of these effects when making their planning decisions.

2.1.2 The EIA has identified the potential effects of the proposed wind turbine development and an assessment has been made as to whether any of these effects could be significant in EIA terms. A number of mitigation measures to reduce potentially significant effect has been incorporated into the design.

2.1.3 The scope of the EIA for the Proposed Development was agreed with Perth and Kinross Council (PKC) and their consultees, through a formal scoping opinion received in August 2018.

2.1.4 The ES reports the findings of the EIA completed in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the EIA Regulations"), which cover developments requiring decisions under the Town and Country Planning (Scotland) Act 1997 as amended.

2.1.5 The ES is divided into four documents:

- Volume 1 Non-Technical Summary (This document)
- Volume 2 Main Text
- Volume 3 Figures and Photomontages
- Volume 4 Appendices

2.1.6 In addition, a Planning Policy Statement has been provided which assesses the development against the Local Development Plan and other material consideration.

3. Environmental Effects

3.1 Introduction

3.1.1 The scoping and consultation exercise identified the potentially significant effects and these were then subject to detailed assessment using methodologies appropriate to the different environmental topics. These methodologies were based on recognised good practice guidelines and legislation. The environmental topics considered in the ES are:

- Landscape and Visual Impact;
- Cultural Heritage;
- Ecology;
- Ground and Water
- Shadow Flicker;
- Noise;
- Infrastructure;
- Tourism, Recreation and Socio-economics.

3.1.2 The findings of the assessments are intended to assist PKC and others in coming to a view about whether or not, and how, the proposed development should proceed.

3.2 The Proposed Development

3.2.1 The proposed development is for a single wind turbine located at Aviva's commercial premises in Pitheavlis, Perth. The proposed development site is located on the south west fringe of Perth and is bounded by the M90 motorway running north-west / south-east, Craigie Hill golf club to the east and residential housing to the north west. The proposed layout is presented in Figure 3, Volume 3 of the ES and displayed at the back of this document.

3.2.2 The planning application is for a single wind turbine up to 77 metres (m) tip height with associated infrastructure such as a crane hardstanding, upgraded access track, and a temporary construction compound. The candidate turbine is between 800 and 900 kilowatts (kW) capacity.

3.2.3 The proposed development would take approximately 4 months to construct on site from start to completion including the removal of any temporary works.

3.2.4 The components for the turbine would be brought to site separately. The overall installation process for the turbine would take approximately 1 - 3 days depending on weather conditions and would not start until weather conditions were suitable.

3.2.5 Once the turbine is in operation, it would be monitored remotely and not staffed. Maintenance personnel would make routine visits by car and or van approximately once a month with intermediate visits as and when necessary.

3.2.6 The Aviva wind turbine would have an operational life of approximately 25 years. After this time, the development would be decommissioned in order to return the land to its former use. If at the end of the wind turbines operational life there remained and environmental or economic requirement for its operation a planning application to the Local Authority for the refurbishment or replacement of the turbine would be considered.

3.3 The Need for the Development

3.3.1 The current drive to increase the use of renewable energy sources is rooted in the recognition that the burning of fossil fuels is a major contributor to the emission of greenhouse gases, the primary cause of global climate change. As part of the response to climate change, the UK and Scottish Governments have entered into binding international agreements, committing to reducing greenhouse gas emissions.

3.3.2 The generation of electricity from renewable energy sources is one of the principal ways in which the Government targets to reduce greenhouse gas emissions are to be met within the current policy framework. Onshore wind energy is recognised as one of the most viable and economic renewable energy technologies available at the present time with Scotland having some of the best wind resources in Europe.

3.3.3 Nationally the importance that has been attached to the achievement of significant reductions in CO_2 and a transition to a low carbon economy cannot be overstated. As such the contribution of this development is seen as part of a wider economic and social restructuring of energy supply, business development and security within Scotland and the UK and is of considerable benefit.

3.3.4 The Scottish Government has set an ambitious target of generating the equivalent of 100% of Scotland's electricity demand from renewable sources by 2020. According to a Scottish Government publication in 2016, the equivalent of 54% of total Scottish electricity consumption came from renewable sources. Although there has been a steady increase of renewable generation, there has also been an increase in electricity demand. Scottish electricity demand has increased by over 60% since 2015, and is increasingly supplying transport demand through battery-powered electric cars and vans.

3.3.5 Installation of the proposed wind turbine would provide an additional 800-900kW of installed capacity into the country.[1]

3.3.6 Taking the lower figure (800kW), the proposed turbine alone would offset 804 tonnes of additional atmospheric carbon dioxide, 18 tonnes of sulphur dioxide and 5 tonnes of nitrous oxide each year. It would generate as much electricity as is used by approximately 481 local homes. The equations used to calculate the number of households supplied and the amount of greenhouse gas emissions reduced is detailed in Appendix 3.1, Volume 4 of the Environmental Statement.

3.3.7 Aviva take climate change very seriously and want to do all they can to try and do their bit as a responsible company to reduce global greenhouse gas emissions. Aviva began purchasing electricity from renewable sources for their UK estates in 2004 and has reduced its worldwide carbon emissions by 53% since 2010. Aviva strongly believe that where it is feasible to produce green energy on their sites they should be reinvesting to make the Perth site as economically and environmentally sustainable as possible for the future.

[1] 800-900kW depending on the model of wind turbine installed

3.4 Planning the Development

3.4.1 Aviva has committed to purchase and or generate 100% of their electricity from renewable sources on a worldwide basis by 2025. Aviva would like to make their Perth site the exemplar site for the group with ambitions to make the site zero carbon. Aviva have already taken a number of steps at the Perth site to reduce their energy consumption including installation of LED lighting and installation of Variable Speed Drives (VSD) to make their heating and lighting system more efficient. In 2017 Aviva installed solar panels on the roof of the building which provides approximately 63,000 kWh a year, or less than 1.5% of Aviva's energy demand for the year. The installation of a single 77m high 800kW wind turbine could potentially provide enough electricity to power over 50% of Aviva's site. For further information on Aviva Perth's Zero Carbon Journey please see Appendix 1, - Making Aviva Perth an Energy Independent and Zero Carbon Location.

3.4.2 Aviva has been considered a suitable site for wind energy development because it has met the following criteria:

- Available land
- Existing site access
- Good wind resource
- Grid Connection in close proximity

3.4.3 In addition, the following environmental requirements influence directly on the site design. These were identified and considered during the development of the project:

- Landscape and Visual Impact
- Cultural Heritage
- Ecology
- Ground and Water
- Shadow Flicker
- Noise
- Infrastructure
- Tourism, Recreation and Socio-economic

3.4.4 Further information relating to the detailed assessment of these aspects is considered below.

3.4.5 All information and consultation responses were analysed in relation to the technical, environmental and operational safety requirements of each element of the wind turbine development. This led to a process of detailed design development as the relevant factors were taken fully into account, as detailed knowledge of the site and feedback from the public was obtained.

3.4.6 The development has been designed to minimise the impact on the local environment and is considered by Purple Renewables to be an appropriate and responsible design.

3.4.7 The final design presented in Figure 3, Volume 3 and appended to this document has been submitted with the planning application and is assessed within this Environmental Statement.

3.5 Landscape and Visual Impact

3.5.1 The landscape and visual impact assessment process combines objective methodology and elements of subjective professional judgement.

3.5.2 In accordance with current best practice guidance, the assessment focuses on the landscape and visual effects that have the potential to be Significant. Judgement needs to be exercised at all stages in terms of the scale of the investigation that is appropriate and proportional. The decision on the extent of the detailed study area was tested by assessment of a range of additional visual receptors requested by Scottish Natural Heritage.

3.5.3 No part of the Site or Study Area lies within a statutorily designated landscape (e.g. National Park or National Scenic Area). The River Tay National Scenic Area is located circa 20km north of the proposed turbine and no intervisibility is predicted. Two non-statutory landscape designations lie within 5km of the proposed turbine and comprise the Ochil Hills Special Landscape Area (SLA), located 4km to the south of the Site and The Sidlaw Hills SLA, located 2.7km east of the Site at the closest point.

3.5.4 The site is located within the car park of the Aviva Site at around 91m above ordnance datum (AOD). The surface is tarmacadam and the parking bays and access roads are surrounded by amenity grassland and ornamental shrubs, with occasional small trees. The Site is located near the eastern end of the main car park and is separated from the M90 corridor to the south by a woodland corridor, typically 20 to 25m in depth.

3.5.5 The landform in the wider locality identifies the site as being located on a slope of the River Tay Valley with land falling away to the north and west. Within the Aviva grounds there is a about a 40m fall in levels to the northeast, noting that along the B9112 Land rises to the north within the urban area including the Cherrybank estate. Further afield and beyond the city, land to the south and southeast of the site gently rises initially and then more steeply to an east-west ridgeline. High points include Mailer Hill at 182m AOD and 1.2km south and further to the southeast Moncreiffe Hill at 223m AOD, 4.3km from the site. East of the Site the land rises steeply above the River Tay at Kinnoul Hill at 220m AOD.

3.5.6 The closest built development to the proposed turbine is the listed former General Accident Pitheavlis Building, now Aviva Building, constructed in the early 1980's and comprising flexible concrete modules, stepped into the slope with landscaped roof terraces. The Aviva Building is located circa 50m north from the turbine and a Sport's Hall, comprising a more recent brick building with steel cladding is located a similar distance to the east of the turbine.

3.5.7 The nearest residential dwelling is located approximatly 350m from the proposed turbine, within a recently constructed housing estate on Bell Gardens, off the B9112. Due to the orientation of the dwellings relative to the proposals, no direct view of the turbine would be available, noting that nearby properties including the listed Pitheavlis Cottages are separated from the proposed turbine by landform along the boundary of the Aviva grounds and mature coniferous tree planting.

3.5.8 The road network in close proximity to the Site include the M90 motorway corridor to the south, with the Aviva buildings and car parking, including the Site screened from the road corridor by a coniferous tree belt. The B9112 Necessity Brae, provides access to the Aviva site.

3.5.9 The edge of Perth in this location comprises a range of man-made development and a range of building styles and ages, dominated by modern post-war housing (typically 1-2 storey) and occasional larger buildings including flats, offices and the motorway service station.

3.5.10 Vertical infrastructure in the rural landscape to the south of the M90 includes pylons that lie 1.2km southwest of the proposed turbine at the closest point and the telecommunication masts on Mailer hill and St. Magdalene's Hill that lie a similar distance to the southeast.

3.5.11 The visual baseline is informed by the Zone of Theoretical Visibility (ZTV) of the proposed turbine which is illustrated on a series of plans. The ZTVs should be interpreted as indicative of a maximum-effect scenario, since they cover tracts of the surrounding landscape where the Proposed Development would in reality be filtered or screened by other intervening elements (e.g. hedgerows, individual trees and scattered buildings).

3.5.12 The photography was undertaken with a high quality Digital SLR camera with a full frame sensor and fixed 50mm lens. Computer generated verified photomontages of the proposed turbine were prepared in accordance with latest SNH Guidance.

3.5.13 In order to meet the proportionate requirements of best practice guidance, viewpoint locations were not proposed where intervening planting or buildings would screen views of the proposed turbine.

3.5.14 The Site for the Proposed Development has a simple landscape fabric and construction-related impacts on the fabric of the Site would be mostly limited to the loss of small areas of amenity grassland and small trees/shrubs on the footprint of the turbine.

3.5.15 The erection of the turbine would constitute the most noticeable aspect of the construction phase as perceived from the wider landscape. Concerning the erection of the turbine, given that the Proposed Development would appear to rise from the ground and be seen over a wider area, the effects would be 'emergent' and increasingly visible until the effects merged into those associated with the operational phase, described below.

3.5.16 The visual effects of the various aspects of the construction phase would be temporary and intermittent and will be minimised by good site management and a relatively short construction programme.

3.5.17 The only operational element of the scheme with the potential to affect the landscape and visual amenity of the study area is the wind turbine itself.

3.5.18 No landscape mitigation is considered to be required to compensate the minimal loss of a small area of amenity grassland and a small number of trees or shrubs.

3.5.19 It is not considered essential to mitigate the close range visual effects of the proposed development from a short section of the B9112 corridor near the Site entrance. However, following the feedback from SNH on the scoping report, it is anticipated that SNH and potentially also the Local Planning Authority may consider it appropriate to provide screening in this location, consisting of semi-mature conifers, secured by a planning condition.

3.5.20 During the operational phase of the development the effect upon the 'Urban' landscape character type and the adjacent rural landscape covered by the 'Lowland Hills' would be Moderate/Minor adverse and Not Significant. Further afield the level of effect upon all other landscape character types would be Minor and Not Significant.

3.5.21 It is assessed that there would be No Significant effects upon the Sidlaw Hills and Ochil Hills Special Landscape Areas and the overall integrity of both designations would remain intact.

3.5.22 The operational effect of the proposed turbine upon the visual amenity of public visual receptors in the surrounding landscape and urban areas has been assessed in detail. The visual amenity experienced from the urban area of Perth at close to medium range would be Moderate and Not Significant. The effects at long range from the Perth urban area would be Minor and Not Significant. The built-up areas of Scone and Tarsappie where occasional long range views of the proposed turbine would be available would be affected to a Moderate/Minor level which is Not Significant.

3.5.23 The operational effects upon the visual amenity of users of the main transport routes would be greatest upon users of the M90 at close range, where Moderate effects that are Not Significant have been assessed. Views from other transport corridors would range from Moderate/Minor and Not Significant from the B9112 and A93, to Minor and Not Significant from the A9. Negligible effects would be experienced from the A94 and the railway.

3.5.24 The effects of the proposed turbine upon the visual amenity of recreational users would be Moderate and Not Significant from a number of core paths at close and medium range, Craigie Hill Golf course and the summit of Kinnoul Hill. The visual amenity of users of Scone Park and distant core paths would be affected to Minor to Negligible level which would be Not Significant.

3.5.25 It is an established planning principle that there is no right to a private view, however where developments by virtue of scale and proximity have the potential to result in overbearing effects upon living conditions then this is a material planning consideration.

3.5.26 There are many operational wind energy schemes in the U.K where residents would be located in close proximity to commercial scale wind turbines. An example is the operational 100m tall turbine at FMC which is located approximately 300m from the nearest housing on the edge of Dunfermline. The Little Raith windfarm comprising 9 turbines at 125m to tip is located approximately 800m distant from the edge of Cowdenbeath at the closest point.

3.5.27 The field assessment from public roads within the urban area, combined with reference to the ZTV and photomontages at Viewpoints 1 and 5, indicate that the likelihood of direct views of the proposed wind turbine from private dwellings would be limited in extent. Intervisibility from dwellings along the B9112 and the nearby recently constructed housing estates would be limited by a combination of property orientation and the intervening coniferous tree planting along the boundary of the Site. Further afield, potential visibility from dwellings within the Cherrybank estate would be frequently restricted by intervening planting and buildings and where some direct views occur, in particular from upper floor rear windows, it is predicted that the turbine would typically have an overall Moderate adverse effect upon visual amenity that is Not Significant.

3.5.28 In terms of cumulative considerations, within 5km of the turbine there are several micro turbines and a single small turbine closely associated with large buildings of a similar or larger scale e.g. Tesco Stores, Scottish and Southern Energy along the A9 corridor. These structures have no potential for any significant cumulative effects with the proposed development from the A9 or any other visual receptors in the locality.

3.5.29 The closest larger scale wind turbines are the 12 No. 91m to tip turbines that form part of the operational Lochelbank Glenfarg Windfarm. The potential for cumulative effects with the proposed development lies in theoretical sequential visual effects from the M90, however review in the field indicates that the operational windfarm is not visible from the motorway due to intervening landform.

3.5.30 It is clear that from careful review in the field and analysis of the other wind energy schemes, that there is no potential for any significant cumulative landscape or visual effects with the proposed development.

3.5.31 In conclusion, the proposed turbine would have no significant effect upon the rural landscape character types or the urban area of Perth or adjoining settlements. The turbine would be clearly visible from a small number of localised visual receptors, however no Significant effects upon visual amenity are predicted.

3.6 Cultural Heritage

3.6.1 The cultural heritage assessment presents an assessment of the effects of the proposed development on the historic environment and combines objective methodology and elements of subjective professional judgement.

3.6.2 A heritage asset (or historic asset) is any element of the historic environment which has cultural significance. Both discrete features, and extensive landscapes defined by a specific historic event, process or theme, can be defined as heritage assets; and assets may overlap or be nested within one another.

3.6.3 Designated assets include Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and Historic Marine Protected Areas. Other assets may also be locally designated through policies in the Local Plan.

3.6.4 The majority of heritage assets are not designated. Some undesignated assets are recorded in Historic Environment Records or Sites and Monuments Records (HERs/SMRs) maintained by local authorities and other agencies. However, many heritage assets are currently unrecorded, and the information contained in HERs and SMRs is not definitive, since they may include features which, for instance, have been entirely removed, or are of uncertain location, dubious identification, or negligible importance. The identification of undesignated heritage assets is therefore to some extent a matter of professional judgement.

3.6.5 Some heritage assets may coincide with visual receptors or landscape character areas, which are assessed in the Landscape and Visual Impact Assessment, and in such cases it is important to recognise the difference in approach between these two topics. Cultural heritage assessment addresses effects on the cultural heritage significance of heritage assets, which may result from, but are not equivalent to,

visual impacts. Similarly, an effect on a landscape character area does not equate to an effect on the cultural heritage significance of heritage assets within it.

3.6.6 There is one Category A listed building in the inner study area, the Aviva Building. As a Category A listed building, the Aviva Building is considered to be of national and high importance.

3.6.7 On the basis of the upland hillside nature of the inner study area and the type of recorded assets in the surrounding area, the archaeological potential of the area is considered to be low.

3.6.8 There is one Conservation Area in the Outer Study Area (OSA); Perth Central Conservation Area (CA577) which encompasses much of the historic centre of Perth.

3.6.9 The eastern edge of the Inventory Battlefield – the Battle of Tippermuir (BTL39) – extends into the OSA.

3.6.10 There are no World Heritage Sites, Scheduled Monuments or Inventory Gardens and Designed Landscapes within the OSA.

3.6.11 The erection of a wind turbine can also result in effects on the settings of historic assets at a distance from the development, by affecting views towards or from the historic asset. The settings of assets within the ISA can also be affected in other ways that include noise, alteration of associated features and changes in land-use; none, however, has been identified and the operational effects that are assessed relate solely to the issue of visual effects on the settings of historic assets.

3.6.12 None of the locally designated heritage assets within the OSA has a wider landscape setting that contributes substantively to its cultural significance. The assessment, therefore, is concerned solely with potential impacts upon the settings of the conservation area, inventory battlefield and listed buildings within the study areas.

3.6.13 The Aviva UK Insurance Building, designed and built between 1979 and 1983, is a late-Modernist insurance company headquarters in an extensive landscaped setting, built into the slope of Craigie Hill with views over the city of Perth to the north. It was built as the world headquarters for the General Accident Fire and Life Assurance Corporation. The architects were James Parr and Partners, the structural and service engineers were Ove Arup and Partners, and the contractor was Sir Robert McAlpine.

3.6.14 It is clear from the listing documentation that the Aviva building was designed to reflect and positively respond to its hillside setting and the landscaped area to the north of the building is an important aspect of its architectural composition. Its form, comprising a series of stepped terraces and gardens, both protects the skyline and reflects the undulating form of the hillside.

3.6.15 The proposed development site is heavily constrained as a result of buffer zones associated with residential housing and the adjacent motorway; the proposed wind turbine would therefore be located in close proximity to the south-east corner of the Aviva Building, at a distance of roughly 50m.

3.6.16 It is clear that panoramic views over the city, contributing to the building's sense of place and its corporate identity, would not be affected at all by the erection of the proposed wind turbine in an area behind and to the side of it. This aspect of its setting would be unaffected and it would therefore continue to contribute to the cultural significance of the building.

3.6.17 The camouflage effect is defined in terms of the building's 'ground-scaping' design, the ribbed-concrete construction which mimics the appearance of striated rock, and the presence of the roof-top gardens and associated planting. None of these characteristics are perceptible in distant views to the building; indeed, despite the mass and extent of the building and its hillside setting, in what would ordinarily be a very visible location, the camouflage effect is such that it can only be experienced at relatively close quarters in south-facing views, such as within the Aviva site itself (in oblique views from parts of the on-site approach road) and the high ground at Viewpoint 5, Volume 3. There are also glimpsed views to the site from parts of Viewlands Terrace and Glasgow Road, in the vicinity of its junction with Needless Road and points south. Key views in which this camouflage effect are experienced would not be interrupted by the presence of the proposed wind turbine. It would still be possible to appreciate and understand how the hillside location has been adapted and incorporated into the design of the building.

3.6.18 Nevertheless, the proposed wind turbine would be a prominent feature in these same south-facing views, disrupting the architectural composition that exists between the 'ground-scaping' building, the terraced hillside and the tree-studded skyline. The effect would be most-clearly demonstrated in the fracturing of the skyline, with the proposed wind turbine as a distracting feature, located immediately adjacent to or oversailing the listed building and competing visually with it.

3.6.19 Visual change would be evident in south and southeast-facing views that contribute to the cultural significance of the Aviva Building, resulting in an appreciable but partial loss of the asset's cultural significance. The proximity of the proposed turbine to the asset would constitute an element of visual prominence and distraction to the architectural composition of the building and its landscaped surroundings. This would be an effect of medium adverse magnitude and moderate significance and, in EIA terms, would be considered to be a significant effect.

3.6.20 An effect of moderate significance is therefore predicted as a result of close-range views within the Aviva site and from the high ground to the northwest. The recessive nature of the building will continue to be appreciated and understood, whilst panoramic views from the building that contribute to its significance will be unaffected. The reservoir of architectural design which is inherent in the fabric of the building, together with its interior spaces and finishes, will also be unaffected by the proposed development.

3.6.21 The assessment has identified an effect of moderate significance on one asset, the Category A listed Aviva Building. The effect relates solely to impact upon the setting of the building and would be discernible in close-range views within the Aviva site and from the high ground to the northwest.

3.6.22 No other heritage assets in the study areas would be affected by the proposed development.

3.6.23 The effect on the setting of the Aviva Building would last for the operational lifetime of the proposed development, after which current conditions would be restored.

3.6.24 A programme of enhancement measures will be proposed to offset the impact of the proposed development. These will include improving access to the interior of the Aviva Building to allow appreciation of the qualities for which the building was listed. This will be facilitated through a number of guided tours specific to the cultural heritage and architecture of the building and an annual fund of £1000 to support archaeological research in Perth and Kinross.

3.6.25 It should be noted that the addition of a wind turbine to the Aviva UK Insurance building will assist in allowing the building to continue to function as a commercial office space, making the building fit for purpose in the 21st century. Local planning policy states that encouragement will be given to proposals to improve the energy efficiency of listed buildings.

3.6.26 In conclusion, whilst the proposed development would give rise to some localised significant effects upon the setting of the listed building, it will be offset to some extent by improving access to the Aviva Building to allow appreciation of the internal qualities for which the building was listed.

3.7 Ecology

3.7.1 The proposed development has been assessed for the likely impacts on features of biodiversity value, including protected and notable species, along with statutory sites for nature conservation importance.

3.7.2 The Aviva site consists of a large commercial office building and a number of smaller buildings e.g. sports centre, extensive car parking area and landscaped gardens. As such, there is limited scope for biodiversity interest within the application Site or immediate surrounding area.

3.7.3 A scope of survey works was agreed through Perth and Kinross Council (PKC). Field surveys were limited to an Extended phase I habitat survey and bat activity surveys. These concluded that the habitats within the application Site and wider survey area were typical of a commercial urban fringe area, with limited overall ecological value.

3.7.4 Bat activity surveys found relatively low levels of bat activity, with activity at the proposed turbine location very low. This is likely a result of the available habitats and presence of overnight security lighting. As a precaution, the project design has maximised the distance between any habitat features which may be used by bats and the proposed turbine location, thereby providing mitigation through design.

3.7.5 Any construction related impacts, such as pollution or noise, will be minimised through implementation of standard control measures.

3.7.6 Potentially significant effects on sensitive bird species are not considered likely to occur. The Site and surrounding area does not provide suitable habitat for sensitive bird species, as defined by Scottish Natural Heritage (SNH). Whilst occasional flights over the Site may occur, these are considered highly unlikely to be regular enough to constitute any risk through collision to the conservation status of any such species within the Eastern Lowlands Natural Heritage Zone. SNH, in their June 2018 correspondence with PKC, further supported this view and considered that the development 'is outwith a nationally or internationally designated nature conservation site and has no significant connectivity to such a site'.

3.7.7 Subsequently, the project will not lead to any significant adverse impacts or effects in relation to protected and notable habitats or species, or nationally or internationally designated sites. Specific mitigation measures beyond those incorporated into project design are therefore not required.

3.8 Ground and Water

3.8.1 The potential effects on the surface water, groundwater, soils and geology of the proposed wind turbine at Aviva have been assessed.

3.8.2 The assessment is primarily concerned with the proposed wind turbine and associated infrastructure (access track, electrical cable, and temporary construction compound), referred to as the proposed development, and covers a study area of up to 2 kilometres (km) from the proposed development site.

3.8.3 Surface water runoff is expected to be low as the road and car parking drainage system intercepts the majority of any rainwater and as a consequence surface rainwater runoff will be low.

3.8.4 Groundwater may be important for some base flow supply to surface water bodies, however surface water bodies are most likely to be dominated by runoff from the existing hard landscaped areas. Overall, the groundwater is considered to be of low sensitivity.

3.8.5 The proposed development is not located within or in close proximity to a SEPA flood risk areas for coastal or river flooding. There is a small area of land

designated as low risk to surface water flooding within 50m of the proposed turbine location.

3.8.6 The nearest water abstraction point is over 100m from the proposed development therefore, no mitigation action has been suggested.

3.8.7 Given that the site is not within an area that may be affected by coal mining, there are no mining sites in the area and that the risk of landslide or other subsidence hazards is very low, it is highly unlikely there will be any potential effects arising from mining activity. Therefore, no mitigation action has been suggested.

3.8.8 Mitigation measure that will be actioned include:

- A Construction Method Statement (CMS) containing details of the proposed and agreed working practices to be adopted on site for all construction activities. This will include a pollution prevention plan, accident management plan and waste management plan.
- A Drainage Management Plan (DMP) detailing proposed surface drainage measures to treat and deal with all the surface runoff from the site, to be designed in accordance with SUDS principals;
- A location map of all potential chemical contamination sources, including all fuel, oil and chemical storage areas, vehicle compounds, refuelling sites, waste depots and on-site sewage systems;
- Procedures for dealing with water contaminated from cement and the excavations into which the cement is to be poured; and Timing of works, including a programme of works which takes into consideration and avoids working during high rainfall events.

3.8.9 The assessment found that there are no significant hydrological, hydrogeological or geological issues affecting the site. Additionally, there are no significant flooding, mining or water quality and abstraction issues affecting the site.

3.8.10 No mitigation measures other than following the relevant Pollution Prevention Guidelines and implementing best practice measures, during the construction phase of the development, will be required.

3.9 Shadow Flicker

3.9.1 Shadow flicker is a phenomenon that can impact the residential amenity of receptors located in the vicinity of wind turbines. An assessment was carried out to

estimate the likely impacts that may occur surrounding a proposed wind turbine at the premises of Aviva in Perth.

3.9.2 An initial calculation was used to determine the area that could potentially be affected, as it is constraint in size and shape by a range of parameters, such as the location and dimension of the wind turbine, the surrounding landform and the trajectory of the sun across the sky. Additionally, Scottish and other guidance has been considered to determine the likely maximum range beyond which the effect is likely to be less or not at all perceptible, thus defining a detailed assessment area extending up to 1000m from the proposed wind turbine.

3.9.3 Within the detailed assessment area, shadow flicker effects have been modelled for 1017 receptors, which were identified using mapping data obtained from Ordnance Survey, information from the Perth & Kinross Council Planning Portal as well as during a site visit. The modelling process started with a conservative astronomic worst-case scenario, with additional detail added-in during subsequent steps to refine the model and to finally arrive at an estimate of the likely shadow flicker effects that should be expected at each receptor under real-world conditions.

3.9.4 In the absence of agreed significance criteria within the context of the Scottish Planning System, the prediction results have been compared to the German exposure thresholds in order to aid a judgment regarding the likely significance of the predicted impacts. Based on the prediction result that relates to modelling real-world conditions as closely as possible, only two receptors, a Sport Centre located immediately to the east and the Aviva building located to the north-west of the proposed wind turbine position, would be exposed to more than 8 hours of shadow flicker per year, which is the threshold beyond which mitigation measures would have to be implemented in Germany. Other receptors may exceed the 30 minutes per day limit on a small number of days, even if their overall annual exposure is relatively low.

3.9.5 If required, mitigation measures could be readily implemented with an electronic controller which pauses the wind turbine rotor when the effect occurs. Alternatively, in specific cases receptor-side mitigation, such as the installation of blinds on affected windows, may also result in a satisfactory solution.

3.9.6 In conclusion, following appropriate mitigation measures, the residual effects of the proposed development are of negligible significance in EIA terms.

3.10 Noise

3.10.1 The potential effects of the proposed turbine on ambient noise and consequently residential amenity has been assessed.

3.10.2 A survey of ambient noise in the vicinity of the proposed wind turbine at the Aviva office complex, Perth has been undertaken. The levels of noise likely to occur at local residential properties as a result of the operation of the turbine have been calculated, and the environmental implications considered.

3.10.3 Given that the separation distances between the proposed development and the nearest residential properties are of the order of hundreds of metres where vibration effects would be imperceptible, only a brief qualitative vibration assessment was conducted.

3.10.4 Preliminary noise predictions for a wind turbine in the 1 megawatt class indicated the area within which a noise immission level of 35 decibels could be exceeded. The area fell within a radius of 475m. The nearest noise-sensitive receptors within the study area were identified so that noise predictions could be made for representative residential properties in accordance with the relevant guidance. It is worthy of note that in any given direction from the proposed turbine, if the noise impact is acceptable at the nearest noise-sensitive location then it must necessarily also be acceptable at more distant locations.

3.10.5 Automatic noise monitoring took place in summer 2018 for a period of six weeks at one main location and one subsidiary location.

3.10.6 The results of the automatic monitoring of noise and wind speed shows the measured noise levels at all locations did not correlate with the wind speed, indicating that other noise sources predominated.

3.10.7 The noise of the turbine is able to comply with the proposed noise limits at all receptor locations. Moreover, the levels will be comfortably below the current levels of background noise and the turbine will for practical purposes be completely inaudible, and therefore the impact of the proposed development is not significant.

3.10.8 The noise levels from the turbine will, even in the worst case, be below the night-time noise limits derived using the ETSU regulations method. The lower fixed night-time noise limit of 43 decibels will be met at all locations, and therefore the impact of the proposed development is not significant.

3.10.9 Vibration from construction operations will be undetectable beyond a few ten of metres from the vibration source. The vibration arising as a result of the passage or operation of an item of construction machinery including earthmoving equipment will be such that no ground vibration during construction will be detectable to a human observer inside neighbouring properties. The levels of vibration inside these properties will be several orders of magnitude lower than the architectural damage criteria given in BS.7385-2:1993, and at least two orders of magnitude below the levels perceptible to a human observer. This magnitude of change is negligible, and not significant.

3.10.10 In conclusion, the proposed development will result in no significant effects, in EIA terms with regard to noise and vibration.

3.11 Infrastructure

3.11.1 The potential effects of the proposed wind turbine on microwave links and other electromagnetic signals (such as those associated with airfields), which are transmitted throughout the country by a wide range of operators, including both statutory agencies and commercial companies has been assessed. There is potential for interference to the transmission of these signals from large structures, including wind turbines, which may be sited close to the signal path.

3.11.2 A comprehensive consultation process has been undertaken with organisations with an interest in telecommunications, aviation, safety and infrastructure for the proposed development site.

3.11.3 The proposed development is out-with consultation zones associated with civil aviation, although within the VOR consultation zone. The DVOR radio beacon at Perth Airport is over 8km from the proposed development NATS have commented that there are no safeguarding issues with regard to the proposed development. The MoD has been consulted, and has responded with some concerns with regards to the effects on low flying operations. The location of the proposed development on the edge of Perth close to residential areas, makes low flying highly unlikely.

3.11.4 No potential impacts on television signals are anticipated due to the digital switchover. However, in the unlikely event that reception may be affected, there are several mitigation measures that will be put in place.

3.11.5 Nineteen microwave links have been identified within a 1 km radius of the site and the potential effects on these have been taken into consideration in the site design process. The turbine is located so the majority of these links will be unaffected, there are however Joint Radio Company (JRC) links which have the potential to be impacted upon and as a result it is recognised that JRC may place a holding objection against the proposed development. Consultation is ongoing with the JRC and the applicant is confident that mitigation can be implemented and agreed upon. It is proposed that appropriate conditions are agreed with the Council to ensure the delivery of these mitigation measures.

3.11.6 In conclusion, following appropriate mitigation measures, the proposed development will have no significant effects, in EIA terms on infrastructure.

3.12 Tourism, Recreation and Socio-economic

3.12.1 Nationally the importance that has been attached to the achievement of significant reductions in CO_2 and a transition to a low carbon economy cannot be overstated. As such the contribution of this development is seen as part of a wider economic and social restructuring of energy supply, business development and security within Scotland and the UK and is of considerable benefit.

3.12.2 The visual change arising from a proposed wind turbine may engender positive or negative responses depending on individual perceptions regarding the merits of wind energy development. The same scheme may be seen by some as attractive, acceptable and contributing to the wellbeing of the natural environment, while others may take a negative stance regarding the wind turbine as unattractive and unacceptable. Independent attitude surveys have consistently concluded that more people view wind power positively than negatively and the level of support seems to increase when surveys are carried out pre and post construction.

3.12.3 Economic benefits will arise in the local area as a result of this proposed development. Direct benefits could result from the construction and operation of the project, subject to suitable local civil and electrical contractors being identified. In addition, there will be a local community fund linked to the operation of the wind turbine which would provide a minimum of £5,000 per year to support local organisations and charities.

3.12.4 There will be indirect benefits in the local area through the support of investment into a significant local employer. The reduction and stabilisation of Aviva's electricity demand will not only directly benefit Aviva, but will also benefit the local

community through the ongoing support and investment in community projects that Aviva is able to provide, along with the benefits to the economy through local sourcing of goods and service.

3.12.5 It has been consistently shown in surveys that support for onshore wind energy is high and importantly for Aviva a recent survey shows that consumers are now more environmentally and socially conscious when making purchasing decisions identifying that 73% of consumers would choose a retailer that uses renewable energy, over one that doesn't and 86% of consumers believe it's worth buying products made using 100% renewable energy, thus aligning with Aviva's ambitions to make the Perth facility 100% supplied by on-site renewable energy.

3.12.6 It has been consistently demonstrated that well sited on-shore wind farms do not have a detrimental impact on tourism. The proposed development has the potential to increase tourism in Perth and Kinross by improving access to the interior of the recently listed category A listed building, through a series of dedicated cultural heritage and archaeology tours.

3.12.7 It is worth noting that at the local level the currently observable social and economic impacts of climate change may be difficult to identify, the cost of such changes, over time will inevitably be felt at all levels. The contribution of this scheme towards limiting and offsetting those costs is a significant benefit which should be measured in its favour at all levels.

3.12.8 Overall it is assessed that the socio-economic considerations observable with regard to this proposal points towards the positive benefits that would occur. There are no fundamental issues that arise through a review of socio-economic or demographic information available. Public attitudes towards wind turbines are increasingly positive and tend to improve following first-hand experience of living near such developments. An assessment has been completed at a range of scales concluding that the development would have the most significant impacts, both positive and negative, at the local scale but that significant benefits are derived from the proposal at all levels and those benefits significantly outweigh and perceived local harm.

3.13 Summary of Effects

3.13.1 The identification of potential positive and negative impact of a proposed development is at the heart of the EIA process. The process of reduction of adverse environmental impacts is considered through-out the design process.

3.13.2 It should be noted that by definition all EIA projects are likely to have significant environmental effects, and this does not mean that the impact of the proposed development, as a whole, is significant in the context of the EIA regulations.

3.13.3 The proposed development will give rise to significant benefits, both in terms of supporting measures to tackle climate change and implementing Scottish Government Policy and in terms of the local economy. Significant weight should be applied to these benefits in the determination of the planning application.

3.13.4 The proposed development would give rise to some localised significant effects, in EIA terms, upon the setting of the listed building, however it will be offset to some extent by improving access to the Aviva Building by way of guided cultural heritage and architecture tours for the public to allow appreciation of the internal qualities for which the building was listed showcasing a Scottish architectural achievement.

3.13.5 The proposed development as a whole will not give rise to significant effects upon the receiving environment. It is clear from this assessment therefore that the proposal, subject to certain mitigation measures which can be secured by planning conditions, will comply with the provisions of the development plan.

Aviva Perth Wind Turbine

Figure 1 - Regional Context

Legend

- Proposed Turbine Locaton
- Land Boundary
- Figure Buffer 1km
- Figure Buffer 2km
- Figure Buffer 3km

0 0.5 1 1.5 km

Scale 1:20,000

Purple Renewables

Aviva Perth Wind Turbine

Figure 2 - Local Context

Legend

- Proposed Turbine Locaton
- Land Boundary

0 100 200 300 400 m

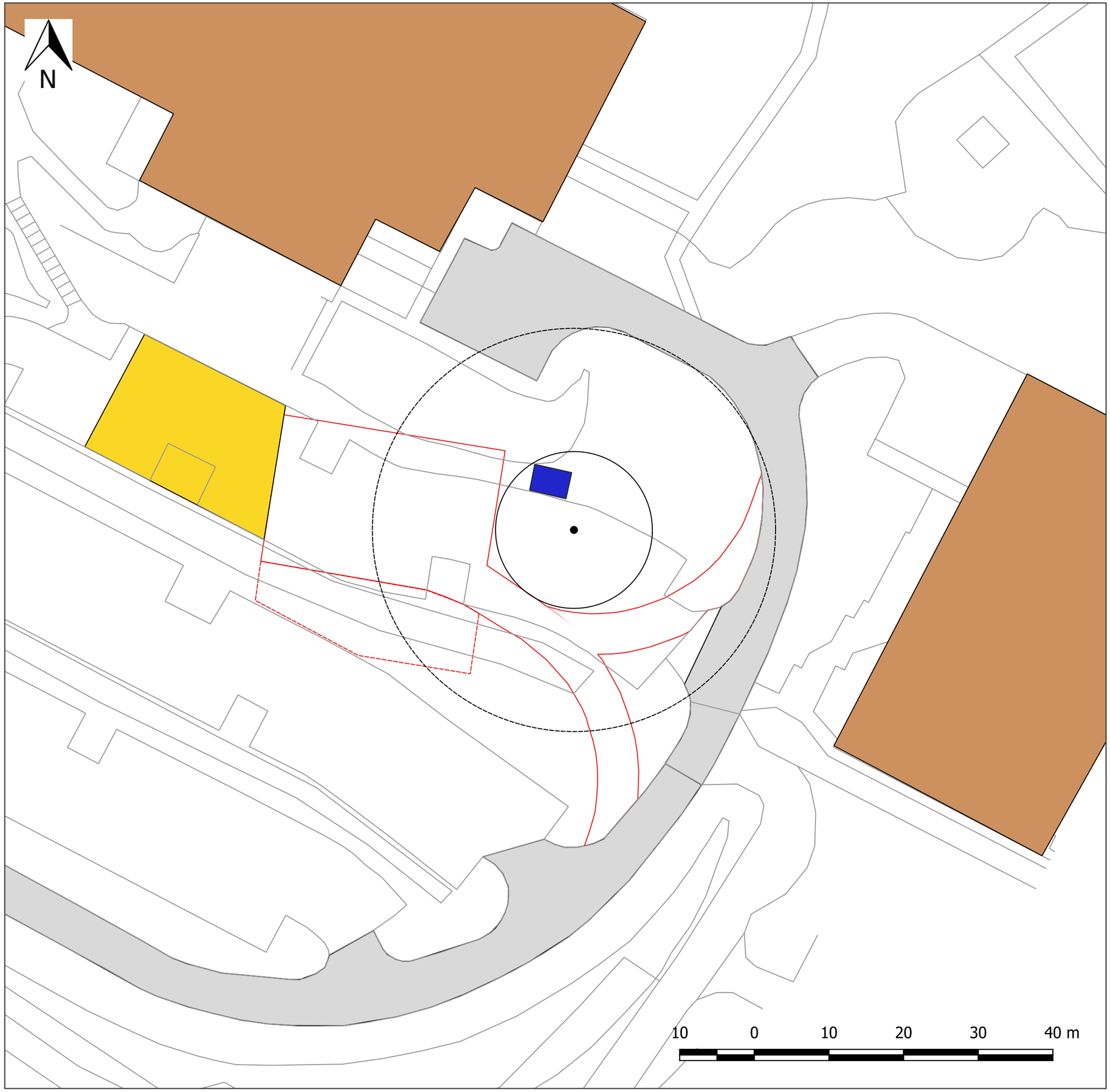
Scale 1:5,000

Purple Renewables

This map should be printed at A3 only

Aviva Perth
Wind Turbine

Figure 3 - Proposed Site Layout



Legend

- Proposed Turbine Location
- Foundation Radius
- Blade Swept Area
- Site Tracks
- Temporary Laydown Area
- Transformer Kiosk
- Temporary Construction Compound
- Existing Building
- Existing Road

Scale 1:500

Drawn By: NM	Date: 24/08/18	Purple Renewables
Checked By: RG	Revision: 001	

AVIVA

Making Aviva Perth an Energy Independent and Zero Carbon Location

Our long-term goal is to be self-sufficient in the energy that we use here in Perth, helping us to reduce our carbon impact and meet our climate change commitments.

In 2017 we used 12,027,425 kWh of energy, costing just over **£1 million**

5,400,708 kWh

6,626,717 kWh

That's equivalent to the energy used by over

800 houses!

What have we done so far?

We've been working hard to reduce the energy we use on site and to generate renewable electricity.

Since 2010 we've reduced our electricity use by nearly 30%

Here are some of the projects that have helped us to achieve this reduction.

2015

Installed energy efficient LED lighting

Saving 10% of the electricity we used in 2015.

2017

Installed solar panel on the roof

Generates 63,000 kWh a year, which is like charging **17.5 million mobile phones.**

2018

Installed variable speed drives to make our heating and ventilation system more efficient.

Saving 10% of the electricity we used in 2018.

What are we planning to do next?

To achieve our long-term goal to be energy independent we've got a lot more work to do. Here are some of the projects that we're hoping to start work on soon.

Smart building controls

We're investing in new technology and data capabilities to further reduce consumption.

Saving 10% of our annual energy use.

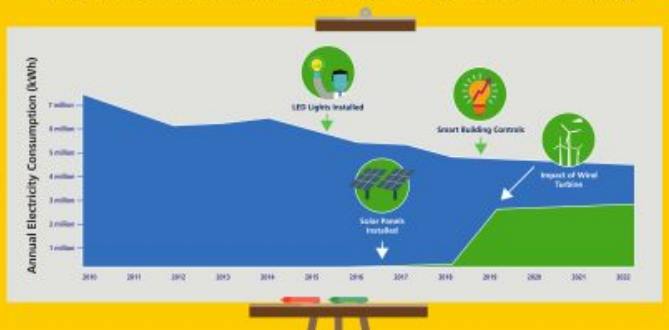
Wind turbine

We're hoping to install a wind turbine to generate clean energy that we can use here on site.

Expected to generate 2,500,000 kWh a year, which is over 50% of our annual electricity use.

Our Journey to 2022

The chart below shows the impact that our projects have had so far on our electricity use, and the incredible positive impact we can have by investing in wind energy.



Prepared for Aviva plc by Purple Renewables