

**ANGUS COUNCIL'S SUBMISSION**

**APPLICATION NUMBER – 14/01067/FULL**

**APPLICANT- BAIRDS MALT SINGLE TURBINE LTD**

**PROPOSAL & ADDRESS – ERECTION OF WIND TURBINE OF 55M TO HUB HEIGHT AND 77M TO  
BLADE TIP AND ANCILLARY DEVELOPMENT AT BAIRDS MALT**

**PEASIEHILL ROAD ELLIOT INDUSTRIAL ESTATE ARBROATH**

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<b>AC129</b>	Mr Roger Peart – 19.01.15	
<b>AC130</b>	Mr Ronald Keith – 10.04.15	
<b>AC131</b>	Mr Scott Ramsay – 17.02.15	
<b>AC132</b>	Mr Shane Bidy – 12.01.15, 19.01.15, 20.01.15, 19.03.15 & 24.07.15	
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<b>AC134</b>	Mr Steven Carnegie – 12.03.15	
<b>AC135</b>	Mr Steven Low – 19.01.15	
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<b>AC137</b>	Mr Walter & Mrs Margaret Hay – 23.01.15	
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<b>AC163</b>	Mrs Margaret Simpson – 30.11.15	
<b>AC164</b>	Mrs Marion Bidy – 13.02.15	
<b>AC165</b>	Mrs Muriel Blake – 19.01.15	
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<b>AC167</b>	Mrs Nancy McCluskey – 28.01.15	
<b>AC168</b>	Mrs Nora Stewart – 07.03.15	
<b>AC169</b>	Mrs Norah Dear – 18.01.15	
<b>AC170</b>	Mrs Norma Bennett – 30.01.15	
<b>AC171</b>	Mrs Patricia Scott -17.02.15	
<b>AC172</b>	Mrs Ruth Boath – 06.02.15	
<b>AC173</b>	Mrs Sandra Waddell – 07.03.15	

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<b>AC176</b>	Mrs Wilma Ewart – 02.02.15	
<b>AC177</b>	Ms Avril Hobbs – 21.01.15	
<b>AC178</b>	Ms Susan Ettershank – 01.02.15	
<b>AC179</b>	Murray Hume – 11.03.15	
<b>AC180</b>	Neil Chapman – 12.02.15	
<b>AC181</b>	Neil Moffat – 10.02.15	
<b>AC182</b>	Nicola Clark – 17.02.15	
<b>AC183</b>	Norma McIntosh 17.02.15	
<b>AC184</b>	Robert Donnelly – 02.03.15	
<b>AC185</b>	Robert Webster – 12.02.15	
<b>AC186</b>	Ross McKenzie – 12.05.15	
<b>AC187</b>	Sarah Larter – 06.02.15	
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<b>AC189</b>	Stuart Gall – 12.02.15	
<b>AC190</b>	Shirley Hoffman – 17.02.15	
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<b>AC198</b>	John Bird -25.03.15	





**Angus Council**

<b>Application Number:</b>	14/01067/FULL
<b>Description of Development:</b>	Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development
<b>Site Address:</b>	Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ
<b>Grid Ref:</b>	361829 : 740071
<b>Applicant Name:</b>	Bairds Malt Single Turbine Ltd

**Report of Handling****Site Description**

The application site is located at the south west of Arbroath in and adjacent to the existing Elliot Industrial Estate. The site lies partly within the existing Baird's Malt site and extends beyond in to the adjacent agricultural land to the west (which has planning permission for an extension to Elliot Industrial Estate – ref: 14/00577/FULM). The site would extend over the Core Path 152 which lies west of the existing industrial premises. The land on which the turbine is proposed is currently hardstanding to the south of an industrial building and west of an area of grain drying apparatus. A line of trees runs to the immediate south of the site which forms the boundary enclosure between Baird's Malt and the industrial premises to the south. The nearest residential property to the proposed turbine would be at Peasiehill Farm Cottages, approximately 300m to the northwest.

**Proposal**

The application is for the erection of a single wind turbine of 77m with associated infrastructure including access, substation and crane hardstanding. The drawings submitted identify a monopole style of turbine tower extending to a hub at 55m above ground and a maximum blade tip height of 77m. The rotor diameter is identified as being 44m. The proposal also includes diversion of the core path so that it curves around the edge of the site.

The application has not been subject of variation.

**Publicity**

The application was subject to normal neighbour notification procedures.

The application was advertised in the Dundee Courier on 16 January 2015 for the following reasons:

- Schedule 3 Development

The nature of the proposal did not require a site notice to be posted.

**Planning History**

The wider Bairds Malt site has benefitted from a number of planning permissions in recent years. These permissions include 07/01141/FUL for the erection of maltings production buildings and barley drying facilities; 08/00469/FUL for the erection of maltings production buildings and barley drying facilities (Re-Application); and 11/00987/FULL for the erection of supplemental malt outloading silos and malt storage silos and associated mechanical handling plant.

12/00922/EIASCRC for Screening Opinion for Wind Turbine was determined as "EIA NOT Required" on 19 November 2012.

Part of the application site benefits from planning permission for the formation of a new business park (ref: 11/00428/FULM as amended by 14/00577/FULM) which allows uses falling under Use Classes 4 (business), 5 (general industry) and 6 (storage and distribution) as identified in the Town and Country Planning (Use Classes) (Scotland) Order 1997.

### **Applicant's Case**

The applicant has submitted the following information in support of the proposal:-

An **Environmental Report** (ER) which describes the development proposed and includes an environmental and policy context; a description of local economic benefits associated with the proposed development (including a socio economic assessment); an assessment of ecology and ornithology; landscape and visual impacts; noise; cultural heritage and archaeology; surface and groundwater hydrology; infrastructure, telecoms and aviation; shadow flicker; carbon balance; and safety. The ER is supported by visual representations of the proposed turbine. The ER reaches the following conclusions:-

- The turbine would be viewed within the current industrial setting of the area, appearing alongside tall vertical elements such as the grain drying towers and large structures of the Maltings Plant. The main impacts upon local amenity will be visual impacts upon the nearest residential receptors, which currently have views of the Maltings site.
- The proposed development at Bairds Malt is deemed to comply with national, regional and local policies relating to wind energy.
- The smallest turbine possible on the site is dictated by the vertical constraints of the site. Sufficient clearance needs to be allowed between the lowest height of the blade sweep and the buildings throughout the site, the tallest of which are the grain drying towers which are 27m in height.
- The ecological and ornithological assessments have shown that the proposal would not adversely impact on protected species or sites.
- The proposed Bairds Malt Wind Turbine is located within urban fringe of Arbroath, within the Elliot Industrial Estate adjacent to the Dipslope Farmland Landscape Character Area, and would affect a proportion of part of this area. As an urban area on the edge of this character area, which is heavily man-modified and busy with activity, there would be very little direct effects on the character, although there would be indirect effects relating to its visibility across the landscape character area to the south-west and west.
- The proposed turbine is located within an industrial zone on the south-western edge of Arbroath. The turbine appears predominately in views alongside the Maltings Plant infrastructure and would be seen alongside these industrial features already present within the view. The turbine may appear slightly more prominent in vertical scale, however, it will fit well with the industrial cladding of the buildings in the surrounding landscape.
- Considering the wider area, the assessment has concluded that there would be no significant indirect effects from any of the other landscape character types or within the study area.
- The viewpoint analysis is contained in Appendix 2.1 and indicates that there would be no Major or Major / Moderate visual effects occurring beyond ~3km from the proposed turbine. The conclusions from the viewpoint assessment have been used to form a view as to the level of overall visual effects within the study area.
- Views of the proposed turbine would be limited from within the neighbouring settlement of Arbroath. The turbine appears as part of the skyline from some of the more elevated open locations within the settlement, appearing in views alongside the Maltings Plant. The two developments appear similar in type with the turbine a fairly industrial feature, similar in colour to the concrete and metal cladding that makes up the Maltings Plant buildings. The majority of the settlement will gain little or no views of the proposed development with the majority of the residential areas located to the north and west of the settlement. The vegetation and built features which surround these areas screening potential views.

The neighbouring Hospitalfield housing estate will experience some views from the areas around the properties, with the turbine appearing alongside the Maltings Plant which is already an easily discernible feature in the views from these more open areas around the housing scheme.

- The Bairds Malt Wind Turbine would rarely be seen in conjunction with other wind developments. The nearest operating turbine is located over 6km inland from the coastal settlement of Arbroath, with the nearest consented development over 10km from the settlement. It is considered that the overall level of cumulative effect due to Bairds Malt Wind Turbine would be negligible.
- It is concluded that the addition of a single turbine to the industrial zone on the south-western edge of Arbroath would have some potentially significant effects, relating to some of the nearest residential receptors, views from some areas of Arbroath and from five of the sixteen viewpoints. While views from some of the residential properties are deemed significant, the impact would not be unacceptable and although prominent in views the turbine would not be an overbearing feature which dominates the receptor nor would it be an overbearing structure that is consistently visible. The turbine appears in views which already contain strong industrial elements from the neighbouring maltings and does not open up any new areas of visibility that may be deemed as scenic or picturesque.
- Typically the turbine is visible along with the infrastructure associated with the Maltings which has been a feature of the skyline in Arbroath for over 40 years. The turbine relates well to the scale of the surrounding buildings and would add a vertical feature to the views which already contain several industrial elements, and take up only a small extent of the horizontal view. As well as the vertical scale, the turbine will fit well with the industrial nature of the buildings with a similar colour palette. These effects are fairly localised occurring within 2-3km of the turbine, with much of the settlement remaining free from views due to the built up nature of the settlement. The addition of a 77m wind turbine to these features will have a low level of impact from a landscape and visual perspective when considered within the wider townscape and landscape setting.
- It has been demonstrated that the project would comfortably meet ETSU-R-97 guidance derived noise constraints at the nearest properties in the absence of any mitigating factors. The information collated here strongly suggests that the proposed turbine would have a low level of noise impact in the context of the noise environment characterised at this location. It is expected that the proposed wind project would rarely be audible, and could therefore be accommodated in this area in noise terms without unacceptable impact on surrounding properties.
- No direct impact has been identified on any feature of cultural heritage interest. In the event that archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of the planning authority. The proposed single turbine has been assessed as having an overall low impact upon Hospitalfield House. With regards to the other features of historical significance within 5km, the proposed development is expected to have a negligible or low level of effect upon their current settings. Therefore the proposed development is not predicted to cause significant adverse impact on the cultural heritage assets within the surrounding area.
- Surface and groundwater hydrology - The drainage of the small area of the development outside the current Bairds boundary will be tied back into the Bairds Malt drainage system.
- An independent aviation study commissioned by the client has established that there are not expected to be any conflicts with civil aviation.
- An independent aviation study has identified that the turbine is likely to be visible to the radar at RAF Leuchars, which may trigger an initial objection. It is proposed that an in-fill radar solution be developed by a specialist aviation consultancy and agreed with the MoD. This approach was successfully adopted for the Govals Wind Farm, with the MoD content to make the successful implementation of such a scheme a condition of planning.
- Impact on television is unlikely. There are a number of technical solutions available should interference be proven as an issue as a result of the turbine.
- A detailed assessment of potential shadow flicker impacts has been undertaken in the area around the proposed Bairds Malt turbine. This has considered the impact on residential, commercial and industrial premises. Taking into account realistic assumptions relating to actual sunlight hours and turbine orientation, shadow flicker impacts are not expected to exceed 6.5 hours per year at the nearest residential properties to the proposed Bairds Malt turbine. Given these results, shadow flicker is not expected to be a nuisance at any residential properties.
- Only turbines with a proven record of safety and reliability will be selected for this site. The risk of ice

throw (ice falling or being thrown from a turbine during particular circumstances) is also low. An ice detection system on the turbines will ensure they are deactivated if there is a risk of ice throw.

**The Socio Economic Assessment** details economic impacts arising from the project including (1) construction impacts of 15 gross / 2 net PYE jobs, £730,000 gross / £95,000 net GVA, £320,000 gross / £40,000 net salaries; (2) operational/maintenance impacts of 5 gross/1 net PYE jobs, £270,000 gross / £70,000 net GVA, £120,000 gross / £30,000 net salaries; and (3) long terms impacts of economic wealth (net GVA) of £63.5m and disposable income (net salaries) of £37.6m. It indicates catalytic activity – safeguarding activity at Arbroath facility including on site impacts of 60 gross / 75 net FTE jobs; £2.8m gross / £3.6m net GVA per annum; £1.6m gross / £2.2 net salaries per annum. It indicates social and catalytic benefits include social impacts of supporting viability of key local employer, generate supply chain opportunities for existing suppliers to Bairds Malt and during construction phase, and training opportunities through community benefits clauses; and catalytic impacts including supporting growth potential of business, reduced carbon footprint, and cleaner and greener energy production.

**Protected Species Report:** the report indicates that the proposed wind turbine would have a negligible impact on the integrity of designated sites including Montrose basin. It indicates that no bats were recorded and the survey area has no potential to support any protected species. It concludes that no further works would be required.

**Supplementary Shadow Flicker Information** (August 2015) which includes mitigation for any property that may be affected by flicker including the implementation of a turbine shut-down strategy; landscaping or the planting of vegetation to provide screening; or the installation of blinds at affected properties. The information also proposes a protocol for assessing any flicker complaints.

**Noise Compliance Report** (November 2015) which identifies an issue with the noise level coming from Kiln Flue 1 of the existing operation when measured from Patrick Allen Fraser Street. The report recommends measures to reduce noise from that flue to ensure that the existing operation meets established noise limits.

**Noise - Supporting Information** (January 2016) provides further noise information including information to assess the existing noise levels generated by activities at the site, additional information relating to noise impacts on property to the south, a fuller assessment of amplitude modulation (blade swish) and information to assess the impact of the proposal on the adjacent business park expansion.

**Supporting Letter** (Kilmac, 10 February 2016) Bairds Malt is Scotland's leading malt producer and has invested significantly in its Arbroath facility since its construction in 1970. The site employs 57 people from the local area and the business has contracts with over 1000 farms, 230 of which are within Angus. The operation consumes in the region of 10GWh of electricity per year, with annual energy costs in the region of £2.5m. The proposed turbine is expected to generate 2.3GWh per year, which equates to around 20% of the plants usage and would reduce business costs and the carbon footprint of the operation. The letter comments on the balancing exercise that takes place in weighing economic and environmental benefits against adverse environmental impacts and indicates that the applicant considers overall impacts to be acceptable.

## Consultations

**Community Council** - There was no response from this consultee at the time of report preparation.

**Angus Council - Roads** - It is noted that the supporting information suggests that the turbine would be landed at Montrose Port and transported south along the A92. The Roads Authority has no objection subject to conditions including the provision of a construction traffic management and routing plan.

**Scottish Water** - There was no response from this consultee at the time of report preparation.

**Ministry Of Defence** - MOD objects to the proposal. MOD has indicated that it would be prepared to remove its objection subject to appropriate conditions requiring (i) the installation of an Air Traffic Control Radar Mitigation Scheme to mitigate the impact of the development on the Primary Surveillance Radar at RAF Leuchars prior to the turbine becoming operational; and (ii) requiring the installation of aviation lighting at the highest practical point of the turbine.

MOD has commented that the turbine would be 24.18 km from, detectable by, and will cause unacceptable interference to the ATC radar at RAF Leuchars without appropriate mitigation. MOD has commented that the applicant submitted a technical proposal to mitigate the unacceptable impacts of the proposed development on the Air Traffic Control (ATC) radar at RAF Leuchars. The proposal has been accepted by the MOD, and a planning condition has been proposed.

MOD has indicated that it is unaware of any proposed mitigation schemes within the military ATC environment which have been successfully implemented to date.

**Angus Council Environmental Health** - Has considered the environmental information submitted in respect of noise and flicker as well as additional information more recently submitted by the applicant in respect of (i) noise impact associated with the proposed turbine; (ii) noise compliance of the existing operation in respect of existing noise limits; and (iii) shadow flicker impacts. Environmental Health has offered no objection to the application on the basis of noise or flicker impact subject to planning conditions to regulate these matters. Environmental Health has indicated that derived noise limits for the turbine are heavily influenced by the existing factory noise levels and has indicated that consideration should be given to prohibiting use of the turbine should the existing noise generating activities at Bairds Malt cease because the background noise environment in which they would be operating would be significantly changed.

**Historic Environment Scotland** - A turbine at this location and of this height will have an impact on the setting of the A-listed Hospitalfield House. Visualisations produced by the agent demonstrate the turbine will be visible in certain views from the house and its grounds. The main elevations and rooms of Hospitalfield look to the west and south where the turbine is proposed. We recognise that existing industrial features, including a telecommunications mast, are part of the established setting of Hospitalfield. The impact of any turbine in this location is therefore likely to be moderate. We agree with the general conclusion of the Environmental Report in relation to Hospitalfield and don't consider that this application raises issues of national significance that warrant an objection.

**NERL Safeguarding** - NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.

**Spectrum** - No objection.

**Joint Radio Co Ltd** - In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided.

**RSPB Scotland** - RSPB does have some knowledge of the ornithological interest of this area but does not consider that significant negative impacts on birds are likely to occur if this proposal is consented. However, there are several proposals for similar sized turbines in this general area, in addition to the already operational turbines in the wider landscape. Post construction monitoring linked to some form of cumulative impact assessment would assist understanding of potential issues connected to the build up of turbines on birds.

**Civil Aviation Authority** - has raised no objection to the proposal.

**Dundee Airport Ltd** - There was no response from this consultee at the time of report preparation.

**Aberdeenshire Council Archaeology Service** - There was no response from this consultee at the time of report preparation.



**Angus Council - Economic Development Unit (EDU)** – The socio-economic report submitted with the application has been reviewed and the findings of the economic impact assessment are agreed. The EDU has commented that Bairds Malt provides a valuable input to the local and wider economy, operating in a price sensitive marketplace where it is desirable to reduce energy costs and remain competitive. The EDU response notes that while the proposed turbine would be very beneficial to Bairds Malt and the Angus economy and it is desirable to see the company prosper; it also recognises that there are other planning matters that need to be considered in determining the application.

## Representations

195 letters of representation were received, of which 1 offered comments which neither supported nor objected to the proposal, 141 objected to the proposal and 53 supported the proposal.

The main points of objection were as follows:

- **noise impact**
- **shadow flicker impact**
- **landscape and visual impact**
- **impact on residential amenity (already experience air and noise pollution)**
- **impact on natural heritage including wildlife**
- **impact on cultural heritage**
- **road safety impact/distraction to road users**
- **impact on aviation**
- **adverse impact on tourism**
- **adverse impact on recreation**

These matters are discussed in the planning assessment later in this report.

- **Devaluation of property** Comment:- this is not a valid planning objection.
- **EIA should be undertaken** Comment:- the application has been screened under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. The screening opinion (ref: 12/00922/EIASCR) concluded that the proposed development is not an EIA development.
- **The setting of an undesirable precedent** – Comment:- there is no concept of binding precedent in planning law and every application is considered on its own merits against relevant development plan policies and other material planning considerations. The acceptability of this application is assessed later in this report.
- **Health and safety & danger to walkers/cyclists/equestrian activities using path network** Comment:- The Government's Specific Advice Sheet on Onshore Wind Turbines indicates that companies supplying products and services to the wind energy industry operate to a series of international, European and British Standards. In the context of these factors I do not consider safety to be a determining factor in the assessment of this application. I have no reason to believe other than that health or safety issues have been properly considered and the risks found to be acceptable.
- **Loss of agricultural land** Comment:-The site is partly contained within the existing Bairds Malt complex and partly within the adjacent agricultural field. I have explained elsewhere in this report that the adjacent agricultural field forms part of an employment land allocation in the current and future land use strategy for Arbroath and benefits from planning permission for employment use. On that basis I do not consider the loss of the small area of agricultural land raises any significant land use planning issues.

The main points of support were as follows:-

- **It is an important development for local business and it is vital that it goes ahead to safeguard existing and future jobs at the operation**
- **It is an industrial setting and the turbine would not detract from its surroundings**
- **The turbine is a suitable distance from residential property and the noise data shows that**

**amenity would be protected**

- **The site has no landscape designation**
- **On site use of electricity generated from renewable sources is in line with government policy**

Comment – The desirability of supporting schemes that generate renewable energy is recognised by development plan policy and those policies provide criteria against which schemes require to be assessed in order to determine their acceptability. This assessment is undertaken later in this report. Similarly the benefit of supporting the economic development in Arbroath is a material consideration and this is also discussed later in this report.

**Development Plan Policies****Angus Local Plan Review 2009**

Policy S1 : Development Boundaries  
 Policy S3 : Design Quality  
 Policy S5 : Safeguard Areas  
 Policy S6 : Development Principles (Schedule 1)  
 Policy ER5 : Conservation of Landscape Character  
 Policy ER11 : Noise Pollution  
 Policy ER16 : Development Affecting the Setting of a Listed Building  
 Policy ER18 : Archaeological Sites of National Importance  
 Policy ER19 : Archaeological Sites of Local Importance  
 Policy ER20 : Historic Landscapes and Designed Landscapes  
 Policy SC16 : Employment Land Supply  
 Policy ER34 : Renewable Energy Developments  
 Policy ER35 : Wind Energy Developments

**TAYplan Strategic Development plan**

Policy 3 : Managing TAYplan's Assets  
 Policy 6 : Energy and Waste/Resource Management Infrastructure

The full text of the relevant development plan policies can be viewed at Appendix 1 to this report.

**Assessment**

Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 require that planning decisions be made in accordance with the development plan unless material considerations indicate otherwise.

Angus Council is progressing with preparation of a Local Development Plan to provide up to date Development Plan coverage for Angus. When adopted, the Angus Local Development Plan (ALDP) will replace the current adopted Angus Local Plan Review (ALPR). The Proposed Angus Local Development Plan was approved by Angus Council at its meeting on 11 December 2014 and subsequently published for a statutory period for representations. The statutory period for representation has now expired and unresolved representations have been submitted to Scottish Ministers for consideration at an Examination. The Proposed ALDP sets out policies and proposals for the 2016-2026 period consistent with the strategic framework provided by the approved TAYplan SDP (June 2012) and Scottish Planning Policy (SPP) published in June 2014. The Proposed ALDP represents Angus Council's settled view in relation to the appropriate use of land within the Council area. As such, it is a material consideration in the determination of planning applications. The Proposed ALDP is, however, at a stage in the statutory process of preparation where it may be subject to further modification. Limited weight can therefore currently be attached to policies and proposals of the plan that are subject to unresolved objection. The policies of the Proposed Plan are only referred to where they would materially alter the recommendation or decision.

In addition to the development plan a number of matters are also relevant to the consideration of the application and these include: -

- National Planning Framework for Scotland 3 (NPF3);
- Scottish Planning Policy (SPP);
- Scottish Government 'Specific Advice Sheet' on Onshore Wind Turbines;
- Tayside Landscape Character Assessment;
- Angus Council Implementation Guide for Renewable Energy Proposals (2012);
- Strategic Landscape Capacity Assessment for Wind Energy in Angus (Ironsides Farrar - 2014);
- Angus Wind farms Landscape Capacity and Cumulative Impacts Study (Ironsides Farrar, 2008);
- Siting and Designing Wind Farms in the Landscape (SNH, Version 2 May 2014);
- 'Assessing The Cumulative Impact of Onshore Wind Energy Developments' (SNH, March 2012)
- Planning Advice Note 1/2011: Planning and Noise.
- Planning Advice Note 52 'Planning in Small Towns'.
- Angus Settlements Landscape Capacity Study - Arbroath (2014)

**NPF3** states that the government is committed to a low carbon Scotland and through the priorities identified in the spatial strategy set a clear direction to tackling climate change through national planning policy. Renewable energy technologies, including onshore wind, are identified as key aspects to realising this aim whilst recognising that a planned approach to development is required to find the correct balance between safeguarding assets which are irreplaceable while facilitating change in a sustainable way.

The **Scottish Planning Policy** (SPP, June 2014) represents a statement of government policy on land use planning. In relation to onshore wind, the SPP states that 'planning authorities should set out in the development plan a spatial framework identifying areas that are likely to be most appropriate for onshore wind farms... The spatial framework is complemented by a more detailed and exacting development management process where the merits of an individual proposal will be carefully considered against the full range of environmental, community and cumulative impact. Proposals for onshore wind should continue to be determined while spatial frameworks are and local policies are being prepared and updated'. Proposals for energy infrastructure developments should always take account of spatial frameworks for wind farms and heat maps where these are relevant. Considerations will vary relative to the scale of the proposal and area characteristics but are likely to include:

- net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities;
- the scale of contribution to renewable energy generation targets;
- effect on greenhouse gas emissions;
- cumulative impacts - planning authorities should be clear about likely cumulative impacts arising from all of the considerations below, recognising that in some areas the cumulative impact of existing and consented energy development may limit the capacity for further development;
- impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker;
- landscape and visual impacts, including effects on wild land;
- effects on the natural heritage, including birds;
- impacts on carbon rich soils, using the carbon calculator;
- public access, including impact on long distance walking and cycling routes and scenic routes identified in the NPF;
- impacts on the historic environment, including scheduled monuments, listed buildings and their settings;
- impacts on tourism and recreation;
- impacts on aviation and defence interests and seismological recording;
- impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;
- impacts on road traffic;



- impacts on adjacent trunk roads;
- effects on hydrology, the water environment and flood risk;
- the need for conditions relating to the decommissioning of developments, including ancillary infrastructure, and site restoration;
- opportunities for energy storage; and
- the need for a robust planning obligation to ensure that operators achieve site restoration.

The Scottish Government's Planning Advice Notes relating to renewable energy have been replaced by Specific Advice Sheets (SAS). The '**Onshore Wind Turbines SAS**' identifies typical planning considerations in determining planning applications for onshore wind turbines. The considerations identified in the SAS are similar to those identified by policies ER34 and ER35 of the ALPR and the SPP as detailed above.

Angus Council has produced an **Implementation Guide for Renewable Energy Proposals**. It provides guidance for development proposals ranging from small single turbines to major windfarms. It indicates that within development boundaries it is not possible to define maximum turbine heights and that turbine developments within towns and villages will be considered in the context of ALPR policies and take account of the following considerations: scale and location; landscape setting; residential amenity including noise, shadow flicker, visual impact etc; historic environment including townscape; compatibility with adjacent uses; proximity to sensitive receptors such as educational buildings, open space and leisure facilities, hospitals, residential care homes, cemeteries, visitor facilities and accommodation and proposed development areas; access; design; security of equipment/facility; and ancillary works.

Scottish Natural Heritage in conjunction with Angus and Aberdeenshire Councils commissioned Ironside Farrar to review current landscape sensitivity and capacity guidance in relation to wind energy development. The **Strategic Landscape Capacity Assessment for Wind Energy in Angus** (March 2014) provides updated information on landscape capacity for wind energy development and the potential cumulative impact of proposals in the context of operational and consented developments. In respect of development within built up areas, it indicates that *whilst it is recognised that some parts of built up areas and settlements may be able to accommodate wind turbines, and indeed do, they have not been included in this landscape character based capacity assessment*. It states that *factors specific to townscape and urban planning are likely to guide location. Consequently urban areas have been left out of the constraints and opportunities map in 6.4, Table 6.1 and the guidance. Nevertheless it is noted in this study that the setting of settlements and the presence of settlements within a wider landscape type has a bearing on landscape character and on capacity for development*.

Scottish Natural Heritage's **Siting and Designing Windfarms in the Landscape** (May 2014) indicates that generally speaking, large wind turbines will appear out of scale and visually dominant in lowland, settled, or smaller-scale landscapes, which are often characterised by the relatively 'human scale' of buildings and features. It states that settlements and buildings within a landscape tend to be sensitive to the development of a wind farm for three main reasons:

- by being places from which people will view a wind farm and within which a key quality may be the provision of shelter and a sense of refuge that may seem impinged upon by the movement and proximity of a wind turbine;
- because buildings act as a size indicator in views that may emphasise the much greater scale of wind turbines in comparison; and
- because the settlement itself often forms a focal feature / landscape pattern to which a development would need to relate.

The SNH publication states that it is important that wind farms do not dominate or negatively affect settlements. The threshold for this effect will vary in different landscapes, for different settlements and with different wind farm and wind turbine designs. The aim should be to minimise the sense of imposition upon buildings and more intimate spaces. This can be achieved by setting the turbines against an open background and avoiding the creation of a visually complex image. In these circumstances, careful

consideration of the nature of views in and out of these areas is needed, along with appreciation of the nature of impacts from recreational areas and residences.

Due to the focus of views along coastlines and the typical concentration of settlements within these areas, a wind farm located near the coast will tend to create a new focal feature or landmark. For this reason, it is important that they do not detract from existing landmarks like historical or navigational features (such as lighthouses), distinctive coastal landforms, coastal settlements and areas valued for recreation.

**Planning Advice Note 52 'Planning in Small Towns'** acknowledges that some development that has taken place, in terms of scale or design in small towns has not been particularly sympathetic to the character of the towns; and encourages local councils and their partners to work together to retain, restore and enhance what is best as well as removing, improving or rehabilitating what is worst. It provides advice on topics including setting and townscape. It indicates that scale and setting in the landscape are key areas to address in considering the scope for and possible direction in which a town could expand and what form development should take. It indicates that matters such as skyline and landmarks should be considered and indicates that from a distance landmark buildings or structures can be easily identified including those which appear out of character; the positive features should act as a reference and control on the height, massing and scale of future development.

**Angus Settlements Landscape Capacity Study - Arbroath (2014)** indicates that:-

- The landscape setting of Arbroath is formed by the valley of the Brothock water in which the town is set. Over time Arbroath expanded out of the valley onto the higher ground, and today its larger settlement area is bounded by the two wooded Dens, the Seaton Den to the north-east and the Den of the Elliot Water to the south-west.
- Arbroath Abbey is the most prominent and famed historical features of the town, with the "Arbroath Eye" of the Abbey tower forming the iconic skyline landmark of the town. The medieval town grew around the Abbey following the landform land inward rather than spreading along the coast.
- The location of Arbroath on low ground surrounded by higher ground on its landward sides ensures that despite its relative size, Arbroath is not extensively visible from a distance.
- The vegetation of the Elliot Water/Kelly Den screens initial views of the town when approaching via the A92. The entry of Arbroath is marked by the view of the Elliot Industrial Estate Grain Silos which are a landmark that is visible over the woodland of the escarpment along the Elliot Burn.
- The most sensitive landscape areas around Arbroath includes the area directly adjacent to the Elliot River Kelly Den.
- In discussing development to the west of the town, it indicates that it would be desirable that any future development is restricted to lower ground and create a permanent edge defined by topography or other landscape features such as watercourses and vegetation.

Proposals for wind turbine developments and associated infrastructure are primarily assessed against policies ER34 and ER35 of the ALPR although other policies within the plan are also relevant. The policy position provides a presumption in favour of renewable energy developments recognising the contribution wind energy can make in generating renewable energy in Scotland. These policies also require consideration of impacts on ecology including birds; cultural heritage including listed buildings, scheduled monuments, designed landscapes and archaeology; aviation; amenity in the context of shadow flicker, noise and reflected light; landscape and visual impact including cumulative impacts; future site restoration; transmitting or receiving systems; any associated works including transmissions lines, road and traffic access/safety and the environmental impact of this. These policy tests overlap matters contained in other policies and therefore these matters are discussed on a topic by topic basis.

### **Environmental and Economic Benefits**

Policy 6 of TAYplan indicates that one of its aims for the city region is to deliver a low/zero carbon future and contribute to meeting Scottish Government energy and waste targets. The local plan indicates that Angus Council supports the principle of developing sources of renewable energy in appropriate locations. The SPP sets out a "commitment to increase the amount of electricity generated from renewable sources" and

includes a target for the equivalent of 100% of Scotland's electricity demand to be generated from renewable sources by 2020 along with a target of 30% of overall energy demand from renewable sources by 2020. Paragraph 154 of the SPP indicates that planning authorities should help to reduce emissions and energy use in new buildings and from new infrastructure by enabling development at appropriate locations that contributes to electricity and heat from renewable sources.

The proposed wind turbine would offset the emission of CO<sub>2</sub> and supply electricity. The Environmental Report (ER), Socio Economic Assessment and other supporting information submitted indicates that Bairds Malt is Scotland's leading malt producer and has invested significantly in its Arbroath facility since its construction in 1970. It is said to process 255,000 tonnes of malt per year, which is destined primarily for distilling and whisky production. The operation is said to consume in the region of 10GWh of electricity per year (the equivalent amount of 2,200 homes), with annual energy costs in the region of £2.5m. The proposed turbine is expected to generate 2.3GWh per year, which equates to around 20% of the plants usage and would reduce business costs and the carbon footprint of the operation. The ER suggests that the overall outcome of the project would be to deliver production and cost efficiencies that would increase the market competitiveness of the business and thus safeguard local jobs. The Socio Economic Assessment identifies numerous worthwhile benefits (listed earlier in this report) and its findings have been confirmed by the Council's Economic Development Unit.

I note the concerns raised by third parties regarding the potential impact of the development on the tourist industry. Whilst there have been a number of surveys undertaken to assess the impact of wind farm development on the tourist industry there does not appear to be definitive information on the impact of existing developments. Although I cannot discount the possibility that some visitors might be deterred from making return visits to holiday accommodation or visitor attractions in the vicinity of the site because of the presence of the wind turbine, I find no persuasive evidence to suggest that it would have an overall adverse effect on tourism in this part of Angus.

It is accepted that the proposed turbine could make a contribution towards renewable energy generation and carbon reduction and as such the proposals attract in principle support from the development plan. It is also accepted that the proposed development would improve the operational efficiency of the Bairds Malt operation and would make it more financially viable going forward, which is a significant benefit to the local economy. I have had regard to the environmental and economic benefits described in the supporting information in undertaking my assessment of the proposal.

### **Landscape Impact**

Policy 6 of TAYplan indicates that in determining proposals for energy development consideration should be given to landscape sensitivity. Local plan Policy ER5 (Conservation of Landscape Character) requires development proposals to take account of the guidance provided by the Tayside Landscape Character Assessment (TLCA), prepared for Scottish Natural Heritage (SNH) in 1999, and indicates that, where appropriate, sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape. Policy ER34 of the local plan indicates that proposals for renewable energy development will be assessed on the basis of *no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints.*

The application site sits on the fringe of the urban area of Arbroath, close to the boundary between the area defined in the local plan as 'coast' (zone 3) and close to the area defined as 'lowland and hills' (zone 2). The local plan indicates that the coast area is *sensitive to the potential landscape and visual impact of large turbines.* It indicates that *the possibility of satisfactorily accommodating turbines in this area should not be discounted* but suggests that *locations associated with the coast are likely to be less suitable.* It further indicates that *in all cases, the scale, layout and quality of design of turbines will be an important factor in assessing the impact on the landscape.* The lowland and hills area *comprises a broad swathe extending from the Highland boundary fault to the coastal plain, much of which is classified as lowest sensitivity.* Within this area there are important examples of higher natural heritage sensitivity such as small scale landscapes and skylines. It states that good siting and design should show respect for localised interests.

The Tayside Landscape Character Assessment (TLCA) identifies that the application site lies within an 'urban' area, but in very close proximity to the Dipslope Farmland LCT and the Coast with Sand LCT.

- The Dipslope Farmland LCT key characteristics are described as an extensive area of land, generally sloping from north-west to south-east; dominated by productive agriculture with a dispersed settlement pattern, including some suburban development. The landscape is described as of medium scale, with semi-enclosed to open enclosure and no notable landscape features. In terms of Forces for Change, the TLCA indicates that this low-lying area is comparatively free from tall structures with the exception of the electricity transmission lines which serve Dundee and Arbroath. It is possible that there may be pressure for additional masts, particularly in the vicinity of major roads, as telecommunications traffic grows.
- The Coast with Sand LCT key characteristics are described as areas of marine alluvium and windblown sand along lower sections of coast; sand dunes inland; ever changing landscape of shifting sands, erosion and deposition and tidal fluctuation; golf courses and limited settlement. The landscape is described as of medium scale, with exposed enclosure and no notable landscape features. In terms of Forces for Change, the TLCA indicates many of the sections of coast are free from signs of modern development and retain an almost timeless character. The erection of masts in areas visible from these or the development of shoreline wind power schemes could have an adverse effect on this character. Any proposals should be assessed carefully in these terms.

PAN 52 'Planning in Small Towns' provides advice on topics including setting and townscape. It indicates that matters such as skyline and landmarks should be considered and indicates that from a distance landmark buildings or structures can be easily identified including those which appear out of character. It indicates that the positive features should act as a reference and control on the height, massing and scale of future development.

The applicant's townscape and landscape assessment within the ER suggests that the turbine is located on the urban fringe of Arbroath, within the Elliot Industrial Estate adjacent to the Dipslope Farmland Landscape Character Area, and would affect a proportion of part of this area. *As an urban area on the edge of this character area, which is heavily man-modified and busy with activity, there would be very little direct effects on the character, although there would be indirect effects relating to its visibility across the landscape character area to the south-west and west.* It states that *the turbine appears predominately in views alongside the Maltings Plant infrastructure and would be seen alongside these industrial features already present within the view. The turbine may appear slightly more prominent in vertical scale, however, it will fit well with the industrial cladding of the buildings in the surrounding landscape. Considering the wider area, the assessment has concluded that there would be no significant indirect effects from any of the other landscape character types or within the study area.*

The location of Arbroath on low ground surrounded by higher ground on its landward sides ensures that despite its relative size, the town is not extensively visible from a distance. The visualisations submitted show that from a distance to the northeast, north, northwest and west the settlement sits down in the landscape with little by way of vertical structures punctuating the skyline (including the existing grain silos). The impact of the existing grain silos is greater in views closer to Arbroath, where they do appear in the skyline without a landscape backcloth. VP05 at Bearfauld Road, VP07 at Salmonds Muir, VP09 at Firthfield and VP10 at Braeside shows that there is little evidence of existing structures rising above the landscape backcloth of the town in views towards and across Arbroath while also demonstrating that the 77m turbine would rise above that landscape backcloth, appearing as a new and prominent skyline feature. In VP10, the turbine also rises above the horizon of the sea which would further increase its contrast to the existing scale of landscape elements within the town.

SLCA guidance indicates that in the Dipslope Farmland Southeast Angus Lowland subarea (iv) Letham, Lunan and Arbroath has medium capacity for turbines up to 50m and no capacity for turbines exceeding 50m. The SLCA guidance indicates that in the Coast with Sand LCA there is low capacity for small/medium turbines and no capacity for turbines exceeding 30m. While the site is located within an urban area it is close to both of those landscape character areas and the development would impact on both of those

areas. Accordingly, the guidance in relation to height is of some relevance and does not support a turbine of this height in this general location.

The site has an urban character falling within the Elliot industrial complex and adjacent to the large grain silos and drying equipment located within the Bairds Malt site. While the site lies on the western periphery of the developed edge of Arbroath, the agricultural land to the immediate west (which is clearly visible on approaches to Arbroath from the west and north west) is allocated for and has planning permission for a western expansion of employment land which is likely to reinforce the industrial context which immediately surrounds the application site. The existing apparatus contained within the Bairds site is said in the supporting information to measure around 27m (with other references in the documentation to 'exceeding 30m'). This information states that the turbine has been designed so that the lowest part of the blades remains above the highest part of the adjacent structure.

The overall height of the turbine at 77m is significantly taller than the tallest buildings within the complex. Those buildings as well as the trees along the southern site boundary provide a vertical scale reference for the turbine, particularly in views from the south (VP02 of Landscape Figures, VP01 of the Residential Assessment Graphics), west (VP02 of the Residential Assessment Graphics), north (VP04 of the Residential Assessment Graphics) and north east (VP03 of Landscape Figures) but also in some views from the east (VP01 of Landscape Figures). Those existing vertical scale references emphasise that the turbine is substantially larger than surrounding elements in the landscape. The size of the turbine would be out of scale relative to smaller scale landscape features such as houses; trees and Kelly Den (see VP1, 2, 5, 8, 9, 10).

The applicants ER indicates that the proposed turbine would be a prominent element from the Coast with Sand LCT. I agree with that general conclusion. Although outwith the Coast with Sand LCT, the turbine would be located within the open relatively flat coastal plain between Carnoustie and Arbroath and a turbine of the size proposed would become a landmark for this part of the Angus coast. It is therefore considered that the proposed turbine would have a significant effect upon the Coast with Sand LCT.

Bringing together the above, while the site selected is within an industrial complex close to existing industrial buildings, it is located on the western periphery of Arbroath in a prominent position on higher ground close to the coast. A 77m turbine in this location would be out of scale when viewed against existing landscape features and would significantly and adversely affect the landscape and townscape in this area. I consider those impacts to be contrary to aims of local plan policies ER5 and ER34.

### **Visual Impact**

Policy S6 of the Angus Local Plan Review requires that proposals should not give rise to unacceptable visual impacts. Policy ER34 of the Local Plan also indicates that renewable energy development will be assessed on the basis of *no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints*.

The application is supported by Zone of Theoretical Visibility (ZTV) information to help understand the would-be visibility of the turbine. ZTVs have been submitted based on both the hub height of the proposed turbine (55m) and the maximum height of the blade (77m). The ZTVs submitted are based on landform modelling and a bare earth analysis and thus do not take account of intervening screening provided by buildings and woodland, for example. They represent a worst case scenario of visibility rather than actual visibility.

The 77m ZTV provided (Figure 7.6) identifies that the turbine would be extensively visible within 5km of the application site. That area includes the settlement of Arbroath, the A92 as far north as Marywell, the A933 to the north to an area south of Colliston, the B9127 to the north west to Denhead of Arbirlot, the coastal area extending west to East Haven and the A92 to an area west of Salmond's Muir. That ZTV also identifies theoretical visibility up to 10km including the rural areas around Friockheim and Leysmill, eastern parts of Carnoustie, Muirdrum, the rural area close to Kirkton of Monikie, Hayhillock, Redford and Carmyllie. Beyond 10km, the ZTV identifies theoretical visibility from areas north of and within Monifieth, Monikie



Country Park, Dubton, Montreathmont, Bolshan, Usan and Braehead. Theoretical visibility is also shown to include St Andrews, Tentsmuir and Tayport in Fife and well as Brown and White Catterthun hillforts. The 55m hub height ZTV presents similar results of theoretical visibility to the 77m maximum height ZTV.

The ER summarises the visual effects during the operational period of the turbine and states *views of the proposed turbine would be limited from within the neighbouring settlement of Arbroath. The turbine appears as part of the skyline from some of the more elevated open locations within the settlement, appearing in views alongside the Maltings Plant. The two developments appear similar in type with the turbine a fairly industrial feature, similar in colour to the concrete and metal cladding that makes up the Maltings Plant buildings. The majority of the settlement will gain little or no views of the proposed development with the majority of the residential areas located to the north and west of the settlement. The vegetation and built features which surround these areas screening potential views. The neighbouring Hospitalfield housing estate will experience some views from the areas around the properties, with the turbine appearing alongside the Maltings Plant which is already an easily discernible feature in the views from these more open areas around the housing scheme.*

In assessing visual impact I consider that it is appropriate to have regard to recent appeal decisions within Angus where this issue has been considered in order to secure a degree of consistency in the decision making process. Planning appeal decisions have generally accepted that residents should be treated as of high sensitivity in assessing the significance of visual impact. The magnitude of change (and, thus, the significance of the impact they will experience) will vary with the context of the house that they occupy: its distance from the proposed wind turbine and orientation in relation to it; the presence of intervening screening from vegetation and other buildings; and the presence of other significant visual features. However it is not only the views from principal rooms that are of importance as residents also use the space around their house and the impact on occupiers and visitors approaching or leaving the properties must also be considered.

The ER includes a residential assessment supported by viewpoints from 7 residential receptors close to the site. It indicates that 63 properties within a radius of 2km of the turbine have been included in the assessment. Of the 24 properties listed in Table 7.13 of the ER, 7 properties are attributed a major or major/moderate level of effect. The ER assessment indicates that when visible the turbine is never an overbearing feature and is not assessed as constituting an unacceptable change to the quality of living for residents.

I do not accept the findings of the residential assessment and consider that the number of properties which would experience significant adverse effects would be greater than stated in the supporting information:-

- From the north west, the properties at Peasiehill Farm Cottages (300m to north west, which the supporting information suggests has a financial interest, but at least one of which was tenanted by a party with no financial interest in the development when I visited the site), Peasiehill Farmhouse (640m to north west), Peasiehill Farm Bungalow (710m to north west), Krojan Cottages (700m to north west) and properties at Crudie (820m to north west) all lie within 1km of the site. Residential viewpoint VP04 Peasiehill is illustrative of the view these properties would experience. Each of these properties would experience views of the proposed turbines from windows, garden areas and/or on approaches and the change in view would be prominent with the addition of an uncharacteristic 77m high vertical and dynamic element in close proximity. Residential receptors are attributed a high level of sensitivity and all would experience a level of effect which is significant.
- From the north/ north east, the housing area including Patrick Allan-Fraser Street (350m to north), Kinghorn Street (515m to north), Glamis Road (500m to north), Hospitalfield Road (600m north east), School Road (620m north east) and Gerrard Place (460m north east) would experience views of the proposed turbines from windows, garden areas and/or on approaches as illustrated by residential viewpoints VP05 (71 Patrick Allen-Fraser Street), VP06 (5 Patrick Allan-Fraser Street) and VP07 (24 School Road). The change in view would be prominent with the addition of an uncharacteristic 77m high vertical and dynamic element in close proximity. Residential receptors are attributed a high level of sensitivity and occupants of properties in this area would experience a level of effect which is significant.

- From the east, there are large housing areas between 1km and 2km from the proposed site with varying degrees of view of the proposed turbine from windows, garden areas and/or on approaches. Such areas include Arbirlot Road West (1.1km north east) and Bankhead Road/Crescent (1km to east). This is illustrated in VP03 Arbirlot Road West of the Landscape and Visual Impact Assessment figures. There are a significant number of properties in this area, including flatted dwellings that would have relatively unobstructed views of the turbine from main windows. The change in view would be prominent for some households with the addition of an uncharacteristic 77m high vertical and dynamic element in reasonably close proximity. Significant effects would occur at a number of these properties including those facing west or south west on Arbirlot Road West and Bankhead Road. Residential receptors are attributed a high level of sensitivity and occupants of properties in this area would experience a level of effect which is significant.
- From the south the properties at Elliot (within 700m to the south) would experience views of the proposed turbines from windows, garden areas and/or on approaches as illustrated by Residential Assessment VP01 A92, Elliot. The change in view would be prominent with the addition of an uncharacteristic 77m high vertical and dynamic element in close proximity. Residential receptors are attributed a high level of sensitivity and occupants of properties in this area would experience a high magnitude of change and as such would experience a level of effect which is significant.

There are a large number of residential properties identified above that would experience a significant level of visual impact as a consequence of the turbine. A significant number of third parties that live in the affected houses have raised concern regarding the visual impact of the wind turbine on their amenity.

The ER contains an assessment of major tourist and transport routes including the A92 (Monifieth to Montrose), A933 (Arbroath to Colliston) and Core Paths 151 and 152. For the A92, the assessment indicates visibility of the turbine primarily over a 6km stretch of the road from Muirdrum to Arbroath which is illustrated by VP07 Salmond's Muir and VP02 Elliot (from the Landscape and Visual Impact Assessment figures). The magnitude of change for the route is assessed in the ER as being medium, resulting in a moderate/minor level of effect. For the Core Paths, the assessment notes that Path 152 passes to the west of the Maltings and the Hospitalfield industrial estate. It states that views of the proposed turbine would occur regardless of direction of travel over the whole section of the path, with the turbine appearing amongst the industrial units. It indicates that the magnitude of change for the route as a whole would be high, resulting in a major/moderate level of effect. The level of effect attributed to Path 151 along the Elliot Water is moderate.

The close proximity of the proposed turbine to core path 152 (as identified in the Angus Council Core Paths Plan, adopted 23 November 2010) is likely to have a detrimental impact on the amenity of the route for recreational walkers. However, the character of that path would change in the event that the adjacent land is developed for employment land as proposed by the local plan. The proposed relocation of the path, to provide a separation distance equivalent to the blade tip height, would help make the proposed turbine less intimidating to path users.

In summary, the ZTV and photomontages from viewpoints illustrate that the impact on residential property within 2km of the site would be significant and adverse. For some properties close to the site the turbine is likely to be over-bearing and oppressive. A significant number of third parties have raised concern regarding the adverse effect that the wind turbine would have on their amenity by virtue of its visual impact. Similar impacts have been found to be unacceptable elsewhere in Angus and I cannot reasonably conclude that they would be acceptable at this location, particularly give the number of properties affected. I do not consider that the proposal satisfies the aims of local plan policies S6 (Schedule 1, criterion b) or ER34 (b) and the proposal would result in significant and adverse visual impacts.

### **Cumulative Landscape and Visual Impact**

An assessment of cumulative landscape and visual effects is also required by local and national policy. SNH Guidance on 'Assessing The Cumulative Impact of Onshore Wind Energy Developments' (March 2012) indicates that cumulative landscape effects can include effects on the physical aspects of the landscape and effects on landscape character. Cumulative visual effects can be caused by combined

visibility and/or sequential effects. Combined visibility may be in combination i.e. where several wind farms are in the observers arc of vision or in succession where the observer has to turn to see various wind farms. Sequential effects occur when the observer has to move to another viewpoint to see different developments.

Wind turbines exceeding 20m in height are approved and/or operational in the following locations within 10km:-

- 4km to north west - 77m turbine at Rosebank, Cuthlie (13/00758/FULL);
- 6.6km to north west – 45.5m turbine at Parkconnon (12/00706/FULL)
- 6.8km to north - 25m turbine at West Mains of Kinblethmont (10/01145/FULL)
- 7.5km to north west - 2 x 20m turbines at Muirhouses Farm (11/00720/FULL)
- 8.1km to north west – 67m at Cononsyth (10/00603/FULL)
- 8.5km to west - 77m turbine at Upper Balmachie (13/00501/FULL);
- 9.8km to north - 45.9m turbine Walkmill Quarry, Inverkeilor (13/00722/FULL)

The ER indicates that the Bairds Malt Wind Turbine would rarely be seen in conjunction with other wind developments. The nearest operating turbine is located over 6km inland from the coastal settlement of Arbroath, with the nearest consented development over 10km from the settlement. Cumulative landscape and visual effects are assessed as being negligible in the ER including certain, likely and uncertain impacts.

SLCA guidance indicates that in the Dipslope Farmland Southeast Angus Lowland subarea (iv) *Letham, Lunan and Arbroath* has medium capacity for turbines up to 50m and no capacity for turbines exceeding 50m. It seeks separation distances of 3-6km between medium sized turbine groups and indicates that the future wind energy landscape type is 'Dipslope Farmland with Occasional wind turbines/ with wind turbines'. SLCA guidance indicates that in the Coast with Sand LCA there is low capacity for small/ medium turbines and no capacity for turbines exceeding 30m. It seeks separation distances of 2-4km between small/medium sized turbine groups and indicates that the future wind energy landscape type is 'Coast with Occasional wind turbines'.

The proposed turbine is within an urban area but is close to both Dipslope farmland and Coast with Sand LCT's. Accordingly the identified separation distances and future wind energy landscape type guidance for both areas has some relevance. The proposal would not comply with the indicated separation distances identified by the SLCA. The paired ZTVs within the ER demonstrate that the proposed turbine would likely be commonly viewed "in combination", "in succession," and "in sequence" with other wind turbines. The frequency of which such interactions occur would extend towards Arbroath and the coast, leading to significant cumulative visual effects.

While I consider that cumulative landscape and cumulative visual impacts of some significance would result from the proposed turbine when considered against other existing or approved turbines; I do not consider that these impacts warrant refusal of planning permission.

#### **Amenity (Noise/Shadow Flicker/Reflected Light)**

Criterion (a) of Policy ER34 requires the siting and appearance of renewable energy apparatus to be chosen to minimise its impact on amenity, while respecting operational efficiency. Policy ER35(c) indicates wind energy developments must have no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light. Policy S6 Schedule 1 also refers to amenity impacts whilst Policy ER11 deals specifically with noise pollution.

I have identified issues in connection with visual impacts on residential amenity earlier in this report. Those impacts are considered to be significant and adverse.

The application is supported by noise and flicker assessments which have been more recently supplemented by additional noise and flicker information (including a noise compliance report relating to the



existing Bairds Malt operation). This information has been assessed by the Council's Environmental Health Service which has commented that the *revised shadow flicker assessment meets with the requirements of this service and demonstrates that any impact caused by shadow flicker should be capable of being mitigated to a satisfactory level, subject to an appropriate condition being attached to any permission.* In respect of noise, Environmental Health has indicated that the issues raised in its consultation response have been resolved and in addition the applicant has also looked at the potential impact of seasonal changes in background plant noise due to non-operation of the fans. A revised assessment including a slight reduction of certain derived noise limits has been carried out and this has demonstrated that operational turbine noise is predicted to be within the revised limits. Taking all the submitted information into consideration Environmental Health is now satisfied that the methodology used for the assessment follows the appropriate guidance for this type of development and does not object to this application on the grounds of noise, subject to appropriate conditions being attached to any permission. I have no reason to consider that the proposal would result in adverse impacts in terms of reflected light.

It is noted that representation has been received regarding noise and flicker impacts. Taking account of the information submitted and the advice provided by Environmental Health (which included a review of the noise assessment information by an independent noise consultant), I am satisfied that the proposal raises no issues which cannot be satisfactorily mitigated in respect of noise, flicker and reflected light.

### **Natural Heritage**

The development plan framework contains a number of policies that seek to protect important species and sites designated for their natural heritage interest and to ensure that proposals that may affect them are properly assessed. It also indicates that the Local Biodiversity Action Plans will constitute material considerations in determining development proposals. Policy ER35 specifically requires that proposals should demonstrate that there is no unacceptable interference to birds. Policy ER4 requires safeguarding of habitats protected under British and European law or other valuable habitats and species.

The 'Onshore Wind Turbines SAS' indicates wind turbine developments have the capacity to have both positive and negative effects on the wildlife, habitats, ecosystems and biodiversity of an area. There is also the potential for negative environmental effects, with possible loss of or damage to valuable habitat resulting from construction of turbine bases, access tracks or other works. Such impacts can be significant particularly if they relate to habitats that are difficult to replicate. There is also the potential of collision risk, displacement or disturbance by forcing birds or bats to alter flight paths. Wind farms should not adversely affect the integrity of designated sites protected under EU and UK legislation (Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs)) or wider conservation interests. Planning guidance produced by Scottish Natural Heritage (SNH) indicates that experience suggests that many bird species and their habitats are unaffected by wind turbine developments and the impact of an appropriately designed and located wind farm on the local bird life should, in many cases, be minimal.

The applicants ER indicates that survey work was completed across the site and the immediately surrounding area, following best practice and industry guidance to identify the species and habitats present. It indicates that no suitable breeding or foraging habitat exists for badger, otter, water vole or protected bird species. Bat surveys were carried out following BCT guidelines and no bats were recorded. It indicates that it is unlikely that the development would have any long-term impact on the integrity of the area's ornithological features or the conservation status of the species found in the area. It also comments that the integrity of qualifying species and habitats for the identified designated sites (Montrose Basin and Firth of Tay SPAs and Elliot Links SSSI) would not be impacted upon.

The site contains no ecological designation and is currently partly in industrial use and partly an agricultural field which has planning permission for an extension to the existing industrial estate. RSPB has been consulted and has indicated some knowledge of the ornithological interest of this area and does not consider that significant negative impacts on birds are likely to occur if this proposal is consented. I have no reason to question the findings of the applicants ER in respect of impacts on natural heritage and note the comments provided by the RSPB. The proposal is considered to be compatible with the natural heritage

protection policies contained within the development plan.

### **Cultural Heritage**

The development plan provides a number of policies that seek to safeguard cultural heritage. Policy ER34 requires proposals for renewable energy development to have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons. Impacts on cultural heritage can include impacts on Schedule Ancient Monuments (SAM's), Historic Gardens and Designed Landscapes (HGDL's), listed buildings, conservation areas and undesignated archaeology. The development could potentially have direct impacts on cultural heritage features or indirect effects such as impacts on setting.

There are no assets located within the application site that are designated for their cultural heritage interest and the proposal would not directly impact on any known cultural heritage. In terms of indirect impacts, the ER contains a 5km study radius which identifies conservation areas, listed buildings, Scheduled Monuments and a Garden and Designed Landscape. The ER identifies only one 'Moderate' impact at the closest feature of high sensitivity to the turbine – Hospitalfield House, which has an associated Fernery and Doocot. The ER asserts that the current setting of the house is such that the Elliot Industrial Estate, the Westway Retail Park and modern residential areas are all features of current views to the south-west. The ER does not consider the proposal would detract from the current setting of the Hospitalfield House, which is also characterised by the belt of mature trees that surround the house and grounds to the west. Historic Environment Scotland was consulted on the proposal and has agreed with the general conclusion of the ER that the impact on Hospitalfield is moderate and offer no objection to the proposal, commenting that it raises no issues of national significance.

The ER suggests that the conservation area of Arbirlot spans the village and encompasses a number of 'B' listed buildings. It suggests that the layout of the conservation area is such that the predominant views from the features are contained within the surrounding buildings of the village. The ER indicates that of the other features of historical significance within 5km, the proposed development is expected to have a negligible or low level of effect upon their current setting. It indicates that the proposed development is not predicted to cause significant adverse impact on the cultural heritage assets within the surrounding area.

I have had regard to the potential impact of the development on cultural heritage assets in the surround area. The proposal would have some impact on a number of those assets, including Hospitalfield House. However, having regard to the advice from Historic Environment Scotland and from my own assessment I am satisfied that those impacts are not unacceptable.

### **Impact on aviation**

Policy ER35 of the Angus Local Plan Review indicates that wind farm development should not interfere with authorised aircraft activity. MOD has commented that the turbine would be 24.18 km from, detectable by, and would cause unacceptable interference to the ATC radar at RAF Leuchars without appropriate mitigation. MOD has commented that the applicant submitted a technical proposal to mitigate the unacceptable effects of the proposed development on the Air Traffic Control (ATC) radar at RAF Leuchars. MOD has however cautioned that it is unaware of any proposed mitigation schemes within the military ATC environment which have been successfully implemented to date. Notwithstanding that, the proposed mitigation has been accepted by the MOD and a planning condition could be used to achieve it as well as aviation lighting. This approach has been taken for other approved wind farm developments in Angus including the Govals and Frawney wind proposals which were approved by a Scottish Government appointed Reporter. No objection to the proposal has been received from CAA, Dundee Airport or NATS and I am satisfied that aviation issues could be addressed through to planning conditions.

### **Other Development Plan Considerations**

No objections have been received from technical consultees regarding the impact of the development on any existing transmitting or receiving systems. Impacts on television are understood to be less problematic

as a result of the digital switchover and the ER suggests that there are a number of technical solutions available should interference be proven as an issue as a result of the turbines. This matter could be addressed by planning condition.

In terms of road safety, the supporting information suggests that the turbine would be landed at Montrose Port and transported south along the A92. The Roads Service has offered no objection subject to conditions including the provision of a satisfactory construction traffic management and routing plan. Site decommissioning is a matter that could be addressed by planning condition requiring a restoration scheme and associated financial guarantee for the restoration works.

The ER suggests that a grid connection has been secured with the utilities company and from the transformer, underground cable runs would link to the existing substation located within the premises. This aspect of the proposal raises no issues and the aim of Policy ER34 to ensure no unacceptable effects of transmissions lines would be met.

### **Other Material Considerations**

Scottish Government policy supports the provision of renewable energy development including wind farms. The SPP confirms that planning authorities should support the development of wind farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. The SPP also indicates that planning authorities should respond to the diverse needs and locational requirements of different sectors and sizes of businesses and take a flexible approach to ensure that changing circumstances can be accommodated and new economic opportunities realised.

The wind turbine would contribute to meeting government targets and in this regard attracts some support from national policy and from the development plan. However, as discussed above I consider that this proposal would result in significant adverse landscape impacts on the setting of Arbroath as well as significant adverse visual impact on residential receptors close to the site. Whilst wind farms are necessary to meet government energy targets and I accept that this is a location where the technology could operate efficiently, I do not consider that the environmental impacts have or can be satisfactorily addressed. Accordingly I do not consider that the proposal receives unqualified support from the SPP.

I recognise the benefit of producing electricity by renewable means, particularly where this would increase the viability of a local employer, but I do not consider that there is anything in government policy that suggests this should be at the expense of other environmental considerations or the amenity of those that live nearby. In the particular circumstances of this case, I do not consider that the environmental or economic benefit of the production of renewable energy outweighs the very direct harm that this proposal would cause to the amenity of occupants of nearby residential property or to the wider landscape setting of the town. For these reasons I do not consider that it justifies granting planning permission contrary to the provisions of the development plan.

Comparison has been made by the applicant between the scale of the turbine proposed in this application to the proposed wind turbines at GSK, Montrose (2 x 132m - refused by Angus Council and on appeal) and the operational turbines at Michelin in Dundee (2 x 120m). While the proposed turbine is smaller than those considered unacceptable at GSK, the current application does give rise to similar issues i.e. significant and adverse visual impacts on residential property and significant and adverse impacts on the landscape setting of the town.

The Reporter who refused the planning appeal for the seven 126m turbines on land at Nether Kelly, Arbroath (PPA-120-2021, decision dated 31 January 2013) approximately 2.5km west of Arbroath commented that he was concerned about the *impact of that development on the setting of Arbroath, which combines elements of landscape, seascape and townscape*. He cautioned against the impact of the town appearing against a backdrop of wind turbines and noted that *they would be viewed against the sky and their rotation would draw the eye, heavily influencing the perceived character of the town's coastal setting*. He was concerned that *those turbines would also strongly influence perceptions of Arbroath for visitors by road or rail coming from the direction of Dundee, who would pass within one kilometre of the wind farm on*

*their approach to the town. Wind turbines could thereby become a defining characteristic of Arbroath, much in the way that the two turbines of similar height at Baldovie are a major defining element of the eastern approach to Dundee.* This proposal is for a smaller, single turbine but it is closer to the town and I am concerned about the impact it would have on its character.

I have had regard to appeal decisions for other wind farm development in Angus. I have taken account of these decisions in so far as they relate to assessment of the acceptability of visual impacts. As detailed above I consider that the current proposal gives rise to visual impacts that are similar to impacts that were considered unacceptable at other appeal sites in Angus. I have used the judgments made by the Reporters in those appeal decisions to assist my assessment and on the basis of my assessment conclude that visual impacts at a large number of properties in the locality of the wind turbines would be unacceptable.

### **Conclusion**

I have had regard to the environmental information provided in relation to the application and comments received from consultees. I have also taken account of all relevant representations made both in support and in opposition to these proposals and to relevant appeal decisions that have given rise to similar issues. As discussed above I have concluded that although the proposed wind turbines would comply with some of the relevant policies and criteria in the development plan, this must be balanced against the significant adverse landscape impacts on the setting of Arbroath and the significant adverse visual impacts for residents in and around Arbroath and close to the site. I accept that the development would contribute towards meeting government energy targets but government guidance confirms that schemes should be supported where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. In this case while the technology would operate efficiently environmental impacts would not be satisfactorily addressed.

I am very conscious that the applicant is a valued employer in the local area and I am sympathetic to their desire to increase the competitiveness of the site and reduce its carbon emissions. However, notwithstanding the benefits that would be derived to the applicant and the economy of the area, for the environmental and amenity reasons identified above I consider that the proposed development is contrary to development plan policy and there are no material considerations that justify approval of the application contrary to the provisions of the development plan.

### **Human Rights Implications**

The recommendation in this report for refusal of this application has potential implications for the applicant in terms of his entitlement to peaceful enjoyment of his possessions (First Protocol, Article 1). For the reasons referred to elsewhere in this report justifying the present recommendation in planning terms, it is considered that any actual or apprehended infringement of such Convention Rights, is justified. Any interference with the applicant's right to peaceful enjoyment of his possessions by refusal of the present application is in compliance with the Council's legal duties to determine this planning application under the Planning Acts and such refusal constitutes a justified and proportionate control of the use of property in accordance with the general interest and is necessary in the public interest with reference to the Development Plan and other material planning considerations as referred to in the report.

### **Equalities Implications**

The issues contained in this report fall within an approved category that has been confirmed as exempt from an equalities perspective.

### **Decision**

The application is refused.

### **Reason(s) for Decision:**

1. That the application is contrary to policies S1 criterion (a), S6 criteria (b), and ER34 criterion (a) of the Angus Local Plan Review (2009) as the proposed development would give rise to unacceptable impacts on the occupants of residential property by virtue of the height of the wind turbine and its proximity to residential properties.
2. That the application is contrary to Policy 6 of TAYplan and policies ER5 and ER34 criterion (b) of the Angus Local Plan Review (2009) as the proposed development would result in unacceptable adverse landscape impacts having regard to landscape character and setting within the immediate and wider landscape.

## Notes:

Case Officer: Ed Taylor  
Date: 29 February 2016

## Appendix 1 - Development Plan Policies

### Policy S1 : Development Boundaries

(a) Within development boundaries proposals for new development on sites not allocated on Proposals Maps will generally be supported where they are in accordance with the relevant policies of the Local Plan.

(b) Development proposals on sites outwith development boundaries (i.e. in the countryside) will generally be supported where they are of a scale and nature appropriate to the location and where they are in accordance with the relevant policies of the Local Plan.

(c) Development proposals on sites contiguous with a development boundary will only be acceptable where there is a proven public interest and social, economic or environmental considerations confirm there is an overriding need for the development which cannot be met within the development boundary.

### Policy S3 : Design Quality

A high quality of design is encouraged in all development proposals. In considering proposals the following factors will be taken into account:-

- \* site location and how the development fits with the local landscape character and pattern of development;
- \* proposed site layout and the scale, massing, height, proportions and density of the development including consideration of the relationship with the existing character of the surrounding area and neighbouring buildings;
- \* use of materials, textures and colours that are sensitive to the surrounding area; and
- \* the incorporation of key views into and out of the development.

Innovative and experimental designs will be encouraged in appropriate locations.

### Policy S5 : Safeguard Areas

Planning permission for development within the consultation zones of notifiable installations, pipelines or hazards will only be granted where the proposal accords with the strategy and policies of this Local Plan and there is no objection by the Health & Safety Executive, Civil Aviation Authority or other relevant statutory agency.

### Policy S6 : Development Principles (Schedule 1)

Proposals for development should where appropriate have regard to the relevant principles set out in Schedule 1 which includes reference to amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information.



## Schedule 1 : Development Principles

### Amenity

- (a) The amenity of proposed and existing properties should not be affected by unreasonable restriction of sunlight, daylight or privacy; by smells or fumes; noise levels and vibration; emissions including smoke, soot, ash, dust, grit, or any other environmental pollution; or disturbance by vehicular or pedestrian traffic.
- (b) Proposals should not result in unacceptable visual impact.
- (c) Proposals close to working farms should not interfere with farming operations, and will be expected to accept the nature of the existing local environment. New houses should not be sited within 400m of an existing or proposed intensive livestock building. (Policy ER31).

### Roads/Parking/Access

- (d) Access arrangements, road layouts and parking should be in accordance with Angus Council's Roads Standards, and use innovative solutions where possible, including 'Home Zones'. Provision for cycle parking/storage for flatted development will also be required.
- (e) Access to housing in rural areas should not go through a farm court.
- (f) Where access is proposed by unmade/private track it will be required to be made-up to standards set out in Angus Council Advice Note 17 : Miscellaneous Planning Policies. If the track exceeds 200m in length, conditions may be imposed regarding widening or the provision of passing places where necessary.
- (g) Development should not result in the loss of public access rights. (Policy SC36)

### Landscaping / Open Space / Biodiversity

- (h) Development proposals should have regard to the Landscape Character of the local area as set out in the Tayside Landscape Character Assessment (SNH 1998). (Policy ER5)
- (i) Appropriate landscaping and boundary treatment should be an integral element in the design and layout of proposals and should include the retention and enhancement of existing physical features (e.g. hedgerows, walls, trees etc) and link to the existing green space network of the local area.
- (j) Development should maintain or enhance habitats of importance set out in the Tayside Local Biodiversity Action Plan and should not involve loss of trees or other important landscape features or valuable habitats and species.
- (k) The planting of native hedgerows and tree species is encouraged.
- (l) Open space provision in developments and the maintenance of it should be in accordance with Policy SC33.

### Drainage and Flood Risk

- (m) Development sites located within areas served by public sewerage systems should be connected to that system. (Policy ER22)
- (n) Surface water will not be permitted to drain to the public sewer. An appropriate system of disposal will be necessary which meets the requirements of the Scottish Environment Protection Agency (SEPA) and Angus Council and should have regard to good practice advice set out in the Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland 2000.
- (o) Proposals will be required to consider the potential flood risk at the location. (Policy ER28)
- (p) Outwith areas served by public sewerage systems, where a septic tank, bio-disc or similar system is proposed to treat foul effluent and /or drainage is to a controlled water or soakaway, the consent of SEPA and Angus Council will be required. (Policy ER23).
- (q) Proposals should incorporate appropriate waste recycling, segregation and collection facilities (Policy ER38)
- (r) Development should minimise waste by design and during construction.

### Supporting Information

- (s) Where appropriate, planning applications should be accompanied by the necessary supporting information. Early discussion with Planning and Transport is advised to determine the level of supporting information which will be required and depending on the proposal this might include any of the following: Air Quality Assessment; Archaeological Assessment; Contaminated Land Assessment; Design Statement; Drainage Impact Assessment; Environmental Statement; Flood Risk Assessment; Landscape Assessment and/or Landscaping Scheme; Noise Impact Assessment; Retail Impact Assessment; Transport

## Assessment.

### Policy ER5 : Conservation of Landscape Character

Development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:

- (a) sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape;
- (b) where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;
- (c) new buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;
- (d) priority should be given to locating new development in towns, villages or building groups in preference to isolated development.

### Policy ER11 : Noise Pollution

Development which adversely affects health, the natural or built environment or general amenity as a result of an unacceptable increase in noise levels will not be permitted unless there is an overriding need which cannot be accommodated elsewhere.

Proposals for development generating unacceptable noise levels will not generally be permitted adjacent to existing or proposed noise-sensitive land uses. Proposals for new noise-sensitive development which would be subject to unacceptable levels of noise from an existing noise source or from a proposed use will not be permitted.

### Policy ER16 : Development Affecting the Setting of a Listed Building

Development proposals will only be permitted where they do not adversely affect the setting of a listed building. New development should avoid building in front of important elevations, felling mature trees and breaching boundary walls.

### Policy ER18 : Archaeological Sites of National Importance

Priority will be given to preserving Scheduled Ancient Monuments in situ. Developments affecting Scheduled Ancient Monuments and other nationally significant archaeological sites and historic landscapes and their settings will only be permitted where it can be adequately demonstrated that either:

- (a) the proposed development will not result in damage to the scheduled monument or site of national archaeological interest or the integrity of its setting; or
- (b) there is overriding and proven public interest to be gained from the proposed development that outweighs the national significance attached to the preservation of the monument or archaeological importance of the site. In the case of Scheduled Ancient Monuments, the development must be in the national interest in order to outweigh the national importance attached to their preservation; and
- (c) the need for the development cannot reasonably be met in other less archaeologically damaging locations or by reasonable alternative means; and
- (d) the proposal has been sited and designed to minimise damage to the archaeological remains.

Where development is considered acceptable and preservation of the site in its original location is not possible, the excavation and recording of the site will be required in advance of development, at the developer's expense

### Policy ER19 : Archaeological Sites of Local Importance

Where development proposals affect unscheduled sites of known or suspected archaeological interest, Angus Council will require the prospective developer to arrange for an archaeological evaluation to determine the importance of the site, its sensitivity to development and the most appropriate means for preserving or recording any archaeological information. The evaluation will be taken into account when determining whether planning permission should be granted with or without conditions or refused.

Where development is generally acceptable and preservation of archaeological features in situ is not feasible Angus Council will require through appropriate conditions attached to planning consents or through a Section 75 Agreement, that provision is made at the developer's expense for the excavation and recording of threatened features prior to development commencing.

#### Policy ER20 : Historic Landscapes and Designed Landscapes

Sites included in the "Inventory of Gardens and Designed Landscapes in Scotland", and any others that may be identified during the plan period, will be protected from development that adversely affects their character, amenity value and historic importance. Development proposals will only be permitted where it can be demonstrated that:

- (a) the proposal will not significantly damage the essential characteristics of the garden and designed landscape or its setting; or
- (b) there is a proven public interest, in allowing the development, which cannot be met in other less damaging locations or by reasonable alternative means.

Protection will also be given to non-inventory historic gardens, surviving features of designed landscapes, and parks of regional or local importance, including their setting.

#### Policy SC16 : Employment Land Supply

Angus Council will maintain a supply of employment land to which proposals for business and industry will be directed as follows:-

- \* Arbroath, Elliot and Kirkton, (minimum 10 ha);
- \* Forfar, Orchardbank (minimum 10 ha);
- \* Montrose, Forties Road and Broomfield (minimum 10 ha);
- \* Brechin, Business Park (minimum 5 ha);
- \* Carnoustie (up to 5 ha);
- \* Kirriemuir (up to 5 ha).

At these locations, and other established employment areas, planning permission will not normally be granted for uses other than Class 4\* (business), Class 5\* (general industry), and Class 6\* (storage and distribution), but may be considered where they are small scale, complementary and ancillary to the existing or proposed use. Development proposals will require to demonstrate there is no detriment to the surrounding amenity.

\* As defined in the Town and Country Planning (Use Classes) (Scotland) Order 1997.

#### Policy ER34 : Renewable Energy Developments

Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria:

- (a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
- (b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
- (c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
- (d) no unacceptable environmental effects of transmission lines, within and beyond the site; and
- (e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape, and
- (f) that there will be no unacceptable impacts on the quantity or quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

#### Policy ER35 : Wind Energy Developments

Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:



- (a) the reasons for site selection;
- (b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;
- (c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;
- (d) that no wind turbines will interfere with authorised aircraft activity;
- (e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;
- (f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;
- (g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

## **TAYplan Strategic Development plan**

### Policy 3 : Managing TAYplan's Assets

#### Employment land:

- Identifying and safeguarding at least five years supply of employment land within principal settlements to support the growth of the economy and a diverse range of industrial requirements;
- safeguarding areas identified for Class 4 office type uses in principal settlements; and
- further assisting in growing the year-round role of the tourism sector.

#### Greenbelts:

- Continuing to designate green belt boundaries at both St. Andrews and Perth to preserve their settings, views and special character including their historic cores; assist in safeguarding the countryside from encroachment; to manage long term planned growth including infrastructure in this Plan's Proposals Map and Strategic Development Areas in Policy 4; and define appropriate forms of development within the green belt based on Scottish Planning Policy;
- Using Perth green belt to sustain the identity of Scone, and provide sufficient land for planned development around key villages and settlements

#### Finite Resources:

Using the location priorities set out in Policy 1 of this Plan to:-

- safeguard minerals deposits of economic importance and land for a minimum of 10 years supply of construction aggregates at all times in all market areas; and
- protect prime agricultural land, new and existing forestry areas, and carbon rich soils (where identified) where the advantages of development do not outweigh the loss of productive land.

#### Natural and Historic Assets:

Understanding and respecting the regional distinctiveness and scenic value of the TAYplan area through:-

- ensuring development likely to have a significant effect on a designated or proposed Natura 2000 sites (either alone or in combination with other sites or projects), will be subject to an appropriate assessment. Appropriate mitigation requires to be identified where necessary to ensure there will be no adverse effect on the integrity of Natura 2000 sites in accordance with Scottish Planning Policy;
- safeguarding habitats, sensitive green spaces, forestry, watercourses, wetlands, floodplains (in-line

with the water framework directive), carbon sinks, species and wildlife corridors, geo-diversity, landscapes, parks, townscapes, archaeology, historic buildings and monuments and allow development where it does not adversely impact upon or preferably enhances these assets; and

- identifying and safeguarding parts of the undeveloped coastline along the River Tay Estuary and in Angus and North Fife, that are unsuitable for development and set out policies for their management; identifying areas at risk from flooding and sea level rise and develop policies to manage retreat and realignment, as appropriate.

#### Transport:

- Safeguarding land at Dundee and Montrose Ports, and other harbours, as appropriate, for port related uses to support freight, economic growth and tourism; and
- Safeguarding land for future infrastructure provision (including routes), identified in the Proposal Map of this Plan or other locations or routes, as appropriate, or which is integral to a Strategic Development Area in Policy 4 of this Plan, or which is essential to support a shift from reliance on the car and road-based freight and support resource management objectives

#### Policy 6 : Energy and Waste/Resource Management Infrastructure

Local Development Plans should identify areas that are suitable for different forms of renewable heat and electricity infrastructure and for waste/resource management infrastructure or criteria to support this; including, where appropriate, land for process industries (e.g. the co-location/proximity of surplus heat producers with heat users).

Beyond community or small scale facilities waste/resource management infrastructure is most likely to be focussed within or close to the Dundee and/or Perth Core Areas (identified in Policy 1).

Local Development Plans and development proposals should ensure that all areas of search, allocated sites, routes and decisions on development proposals for energy and waste/resource management infrastructure have been justified, at a minimum, on the basis of these considerations:-

- The specific land take requirements associated with the infrastructure technology and associated statutory safety exclusion zones where appropriate;
- Waste/resource management proposals are justified against the Scottish Government's Zero Waste Plan and support the delivery of the waste/resource management hierarchy;
- Proximity of resources (e.g. woodland, wind or waste material); and to users/customers, grid connections and distribution networks for the heat, power or physical materials and waste products, where appropriate;
- Anticipated effects of construction and operation on air quality, emissions, noise, odour, surface and ground water pollution, drainage, waste disposal, radar installations and flight paths, and, of nuisance impacts on of-site properties;
- Sensitivity of landscapes (informed by landscape character assessments and other work), the water environment, biodiversity, geo-diversity, habitats, tourism, recreational access and listed/scheduled buildings and structures;
- Impacts of associated new grid connections and distribution or access infrastructure;
- Cumulative impacts of the scale and massing of multiple developments, including existing infrastructure;
- Impacts upon neighbouring planning authorities (both within and outwith TAYplan); and,

- Consistency with the National Planning Framework and its Action Programme.

**DEVELOPMENT BOUNDARIES**

1.29 Angus Council has defined development boundaries around settlements to protect the landscape setting of towns and villages and to prevent uncontrolled growth. The presence of a boundary does not indicate that all areas of ground within that boundary have development potential.

**Development boundaries:**

Generally provide a definition between built-up areas and the countryside, but may include peripheral areas of open space that are important to the setting of settlements.

**Policy S1 : Development Boundaries**

**(a) Within development boundaries proposals for new development on sites not allocated on Proposals Maps will generally be supported where they are in accordance with the relevant policies of the Local Plan.**

**(b) Development proposals on sites outwith development boundaries (i.e. in the countryside) will generally be supported where they are of a scale and nature appropriate to the location and where they are in accordance with the relevant policies of the Local Plan.**

**(c) Development proposals on sites contiguous with a development boundary will only be acceptable where there is a proven public interest and social, economic or environmental considerations confirm there is an overriding need for the development which cannot be met within the development boundary.**

**Public interest:** Development would have benefits for the wider community, or is justifiable in the national interest.

Proposals that are solely of

commercial benefit to the proposer would not comply with this policy.

## DESIGN QUALITY

1.37 High quality, people-friendly surroundings are important to a successful development. New development should add to or improve the local environment and should consider the potential to use innovative, sustainable and energy efficient solutions. A well-designed development is of benefit to the wider community and also

provides opportunities to:

- create a sense of place which recognises local distinctiveness and fits in to the local area;
- create high quality development which adds to or improves the local environment and is flexible and adaptable to changing lifestyles;
- create developments which benefit local biodiversity;
- create energy efficient developments that make good use of land
- and finite resources.

1.38 Design is a material consideration in determining planning applications. In all development proposals consideration should be given to the distinctive features and character of the local area. This includes taking account of existing patterns of development, building forms and materials, existing features such as hedgerows, trees, treelines and walls and distinctive landscapes and skylines.

1.39 The preparation of a design statement to be submitted alongside a planning application is encouraged, particularly for major developments or those affecting listed buildings or conservation areas. Early contact with Planning and Transport is recommended so that the requirement for a design statement can be determined.

**Designing Places - A policy statement for Scotland – Scottish Executive 2001** This is the first policy statement on designing places in Scotland and marks the Scottish Executive's determination to raise standards of urban and rural development. Good design is an integral part of a confident, competitive and compassionate Scotland.

Good design is a practical means of achieving a wide range of social, economic and environmental goals, making places that will be successful and sustainable.

**PAN 68 Design Statements** Design Statements should explain the design principles on which the development is based and illustrate the design solution.

The PAN explains what a design statement is, why it is a useful tool, when it is required and how it should be prepared and presented.

The aim is to see design statements used more effectively in the planning process and to

### Policy S3 : Design Quality

**A high quality of design is encouraged in all development proposals. In considering proposals the following factors will be taken into account:**

- **site location and how the development fits with the local landscape character and pattern of development;**
- **proposed site layout and the scale, massing, height, proportions and density of the development including consideration of the relationship with the existing character of the surrounding area and neighbouring buildings;**
- **use of materials, textures and colours that are sensitive to**
- **the surrounding area; and**
- **the incorporation of key views into and out of the development.**

**Innovative and experimental designs will be encouraged in appropriate locations.**

## **SAFEGUARD AREAS**

1.42 Angus Council is required to consult a number of statutory agencies, such as the Health and Safety Executive (HSE) or the Civil Aviation Authority (CAA), where development proposals fall within the prescribed consultation zones of notifiable installations, pipelines or hazards. Where appropriate, the consultation areas are illustrated on the Proposals Maps.

1.43 Angus contains a number of installations handling notifiable substances, including pipelines. Whilst they are subject to stringent controls under existing health and safety legislation such as the Health and Safety at Work etc. Act 1974 and the Control of Major Accident Hazards Regulations 1999 (COMAH), it is also a requirement of European Council Directive 96/82/EC (Seveso II) to control the kinds of development permitted in the vicinity of these installations. For this reason the Planning Authority has been advised by the HSE of consultation distances for each of these installations. In determining whether or not to grant planning permission for a proposed development within these consultation distances the Planning Authority will consult with the HSE about risks to the proposed development from the notifiable installation in accordance with the Town and Country Planning (Hazardous Substances) (Scotland) Regulations 1993 (Circular 5/1993). This will take account of the requirements of the Seveso II Directive to maintain appropriate distances between establishments and residential areas, areas of public use and areas of particular natural sensitivity or interest, so as not to increase the risks to people.

### **Policy S5 : Safeguard Areas**

**Planning permission for development within the consultation zones of notifiable installations, pipelines or hazards will only be granted where the proposal accords with the strategy and policies of this Local Plan and there is no objection by the Health & Safety Executive, Civil Aviation Authority or other relevant statutory agency.**

**DEVELOPMENT PRINCIPLES**

1.44 The principles in Schedule 1 provide a 'checklist' of factors which should be considered where relevant to development proposals. They include amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information. The Local Plan includes more detailed policies relating to some principles set out. Not all development proposals will require to comply with all of the principles.

**Policy S6 : Development Principles**

**Proposals for development should where appropriate have regard to the relevant principles set out in Schedule 1 which includes reference to amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information.**

**Schedule 1 : Development Principles****Amenity**

- a) The amenity of proposed and existing properties should not be affected by unreasonable restriction of sunlight, daylight or privacy; by smells or fumes; noise levels and vibration; emissions including smoke, soot, ash, dust, grit, or any other environmental pollution; or disturbance by vehicular or pedestrian traffic.
- b) Proposals should not result in unacceptable visual impact.
- c) Proposals close to working farms should not interfere with farming operations, and will be expected to accept the nature of the existing local environment. New houses should not be sited within 400m of an existing or proposed intensive livestock building. (Policy ER31).

**Roads/Parking/Access**

- d) Access arrangements, road layouts and parking should be in accordance with Angus Council's Roads Standards, and use innovative solutions where possible, including 'Home Zones'. Provision for cycle parking/storage for flatted development will also be required.
- e) Access to housing in rural areas should not go through a farm court.
- f) Where access is proposed by unmade/private track it will be required to be made-up to standards set out in Angus Council Advice Note 17: Miscellaneous Planning Policies. If the track exceeds 200m in length, conditions may be imposed regarding widening or the provision of passing places where necessary
- g) Development should not result in the loss of public access rights. (Policy SC36)

**Landscaping / Open Space / Biodiversity**

- h) Development proposals should have regard to the Landscape Character of the local area as set out in the Tayside Landscape Character Assessment (SNH 1998). (Policy ER5)
- i) Appropriate landscaping and boundary treatment should be an integral element in the design and layout of proposals and should include the retention and enhancement of existing physical features (e.g. hedgerows, walls, trees etc) and link to the existing green space network of the local area.
- j) Development should maintain or enhance habitats of importance set out in the Tayside Local Biodiversity Action Plan and should not involve loss of trees or other important landscape features or valuable habitats and species.
- k) The planting of native hedgerows and tree species is encouraged.
- l) Open space provision in developments and the maintenance of it should be in accordance with Policy SC33.

**Drainage and Flood Risk**

- m) Development sites located within areas served by public sewerage systems should be connected to that system. (Policy ER22)
- n) Surface water will not be permitted to drain to the public sewer. An appropriate system of disposal will be necessary which meets the requirements of the Scottish Environment Protection Agency (SEPA) and Angus Council and should have regard to good practice advice set out in the Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland 2000.
- o) Proposals will be required to consider the potential flood risk at the location. (Policy ER28)
- p) Outwith areas served by public sewerage systems, where a septic tank, bio-disc or similar system is proposed to treat foul effluent and /or drainage is to a controlled water or soakaway, the consent of SEPA and Angus Council will be required. (Policy ER23).

**Waste Management**

- q) Proposals should incorporate appropriate waste recycling, segregation and collection facilities (Policy ER38).
- r) Development should minimise waste by design and during construction.

**Supporting Information**

- s) (s) Where appropriate, planning applications should be accompanied by the necessary supporting information. Early discussion with Planning and Transport is advised to determine the level of supporting information which will be required and depending on the proposal this might include any of the following: Air Quality Assessment; Archaeological Assessment; Contaminated Land Assessment; Design Statement; Drainage Impact Assessment; Environmental Statement; Flood Risk Assessment; Landscape Assessment and/or Landscaping Scheme; Noise Impact Assessment; Retail Impact Assessment; Transport Assessment.



## WORKING

2.43 Access to suitable employment opportunities is an essential part of a sustainable Angus. Jobs provide more than just income, and are an important part of most peoples' lives. Angus retains a higher proportion of the workforce in agriculture, forestry, fishing and manufacturing (20%) than the Scottish average (14%), but the service sector provides the majority of jobs (74%).

2.44 Most employment is focused on the towns where infrastructure, communications and labour force are most readily available. Changes in farming and associated activities have had a significant impact on the rural economic structure. Tourism is an important part of the Angus economy and provides opportunities throughout Angus.

2.45 In promoting the development of sustainable communities, this Local Plan aims to stimulate investment in Angus by encouraging the retention or upgrading of existing business sites and premises and providing a range of employment sites in key locations to meet demand. There is also support for tourism activities and proposals for farm diversification that contribute to the rural economy.

### Angus Towns - Employment Land

2.46 In line with the Dundee and Angus Structure Plan, a supply of employment land will be maintained in Arbroath, Forfar, Montrose, Brechin, Carnoustie and Kirriemuir that reflects their size and requirements. Development will generally be directed to existing and proposed serviced industrial estates and business parks. Whilst this does not prohibit new business development outwith these areas, there is a presumption in favour of directing employment uses within the towns to sites identified for that purpose.

2.47 Employment land available for development is currently well distributed across the Angus towns:

Arbroath	Kirkton	9.2ha
	Elliot	1.0ha
Brechin	Business Park	7.8ha
Carnoustie	Panmure	0.5ha
Forfar	Orchardbank	29.6ha (gross)
Kirriemuir	North Mains of Logie	2.7ha
Montrose	Forties	7.6ha
	Broomfield	4.8ha
<b>Angus Total</b>		<b>63.2ha</b>

Source: 2004 Employment Land Survey, Department of Planning and Transport – land available for development now or within five years

### Employment Land Supply

2.48 Employment opportunities should be well related to the transport network and available workforce. The allocation of

#### **Vision:**

*To raise the quality of life of the Scottish people through increasing economic opportunities for all on a socially and environmentally sustainable basis.*

**The Way Forward: Framework for Economic Development in Scotland; Scottish Ministers, June 2000**

*Land used for employment purposes also needs to be well located in relation to the transport network and the labour force.*

**The Way Forward: Framework for Economic Development in Scotland; Scottish Ministers, June 2000**

#### **Dundee And Angus Structure Plan Aims –**

- *provide a range of employment sites in key locations to meet and encourage demand through-out the plan period;*
- *identify and encourage major tourism opportunities; and*
- *facilitate the sensitive development and diversification of the rural economy.*

employment land is based on the accessibility of sites, availability of infrastructure, environmental quality and capacity, and transport links. To provide a range of sites capable of meeting the changing needs of business throughout the plan period and beyond, provision is made in each of the main towns for a minimum five-year supply. Monitoring the take up and distribution of employment development will ensure land is continually available.

#### **Policy SC16 : Employment Land Supply**

**Angus Council will maintain a supply of employment land to which proposals for business and industry will be directed as follows:**

- **Arbroath, Elliot and Kirkton, (minimum 10 ha);**
- **Forfar, Orchardbank (minimum 10 ha);**
- **Montrose, Forties Road and Broomfield (minimum 10 ha);**
- **Brechin, Business Park (minimum 5 ha);**
- **Carnoustie (up to 5 ha);**
- **Kirriemuir (up to 5 ha).**

**At these locations, and other established employment areas, planning permission will not normally be granted for uses other than Class 4\* (business), Class 5\* (general industry), and Class 6\* (storage and distribution), but may be considered where they are small scale, complementary and ancillary to the existing or proposed use. Development proposals will require to demonstrate there is no detriment to the surrounding amenity.**

*\* As defined in the Town and Country Planning (Use Classes) (Scotland) Order 1997.*

## Landscape Character

3.10 The landscape of Angus is one of its most important assets. It ranges in character from the rugged mountain scenery of the Angus Glens, through the soft rolling cultivated lowland landscape of Strathmore to the sandy bays and cliffs of the coast.

3.11 A small part of north-west Angus is statutorily designated as part of a larger National Scenic Area (NSA). The character and quality of this landscape is of national significance and special care should be taken to conserve and enhance it. Part of the upland area of Angus, including the NSA, is contained within the Cairngorms National Park which is excluded from the Angus Local Plan Review. The guidance provided by the adopted Angus Local Plan will remain in force until it is replaced by a Cairngorms National Park Local Plan prepared by the National Park Authority. The Cairngorms was made a National Park in September 2003 because it is a unique and special place that needs to be cared for – both for the wildlife and countryside it contains and for the people that live in it, manage it and visit it. It is Britain's largest national park.

3.12 In seeking to conserve the landscape character of the area it is important to assess the impact of development proposals on all parts of the landscape. To assist in this the "Tayside Landscape Character Assessment (1999)" commissioned by Scottish Natural Heritage establishes landscape character zones and key character features within the local plan area to provide a better understanding of them and thus to enable better conservation, restoration, management and enhancement. Landscape Character Zones for the Local Plan Area are shown in Figure 3.2.

### **National Scenic Area:**

*Nationally important area of outstanding natural beauty, representing some of the best examples of Scotland's grandest landscapes particularly lochs and mountains.*

### **National Park (Scotland) Act 2000** sets out four key aims for the park:

- *To conserve and enhance the natural and cultural heritage of the area;*
- *To promote sustainable use of the natural resources of the area;*
- *To promote understanding and enjoyment (including recreation) of the special qualities of the area by the public;*
- *To promote sustainable economic and social development of the area's communities.*

### **Tayside Landscape Character Assessment 1999:**

*A detailed hierarchical assessment based on variations in the Tayside landscape, with a series of management and planning guidelines designed to conserve and enhance its distinctive character.*

Figure 3.2 : Landscape Character Zones



- 1a** Upper Highland Glens
- 1b** Mid Highland Glens
- 3** Highland Summits & Plateaux
- 5** Highland Foothills
- 8** Igneous Hills
- 10** Broad Valley Lowland

- 12** Low Moorland Hills
- 13** Dipslope Farmland
- 14a** Coast with sand
- 14b** Coast with cliffs
- 15** Lowland Basin

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3.13 Where appropriate, development proposals will be considered in the context of the guidance provided by the Tayside Landscape Character Assessment. The assessment identifies different landscape character zones, considers their capacity to absorb change, and indicates how various types of development might best be accommodated to conserve characteristic landscape features and to strengthen and enhance landscape quality. Particular attention is focussed on the location, siting and design of development and the identification of proposals which would be detrimental to the landscape character of Angus.

**Policy ER5 : Conservation of Landscape Character**

**Development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:**

- (a) sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape;**
- (b) where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;**
- (c) new buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;**
- (d) priority should be given to locating new development in towns, villages or building groups in preference to isolated development.**

## Noise Pollution

3.20 Noise can have a significant impact on our health, quality of life and the general quality of the environment. The planning system has an important role in preventing and limiting noise pollution and the noise implications of development can be a material consideration in determining applications for planning permission adjacent to existing noise sensitive development or where new noise sensitive development is proposed.

### **Policy ER11 : Noise Pollution**

**Development which adversely affects health, the natural or built environment or general amenity as a result of an unacceptable increase in noise levels will not be permitted unless there is an overriding need which cannot be accommodated elsewhere. Proposals for development generating unacceptable noise levels will not generally be permitted adjacent to existing or proposed noise sensitive land uses.**

**Proposals for new noise-sensitive development which would be subject to unacceptable levels of noise from an existing noise source or from a proposed use will not be permitted.**

#### ***Planning Advice Note 56 - Planning and Noise (1999)***

*Noise sensitive land uses should be generally regarded as including housing, hospitals, educational establishments, offices and some livestock farms.*



## LISTED BUILDINGS

3.34 The relationship of a listed building with the buildings, landscape and spaces around it is an essential part of its character. The setting of a listed building is, therefore, worth preserving and may extend to encompass land or buildings some distance away. Insensitive development can erode or destroy the character and/or setting of a listed building. Consequently planning permission will not be granted for development which adversely affects the setting of a Listed Building. Trees and landscaping, boundary walls and important elevations may be particularly sensitive to the effects of development.

### **Policy ER16 : Development Affecting the Setting of a Listed Building**

**Development proposals will only be permitted where they do not adversely affect the setting of a listed building. New development should avoid building in front of important elevations, felling mature trees and breaching boundary walls.**

## Ancient Monuments and Archaeological Sites

3.36 Angus has a rich heritage of archaeological remains ranging from crop marks and field systems through to structures such as standing stones, hill forts, castles and churches. They are evidence of the past development of society and help us to understand and interpret the landscape of today. They are a finite and non-renewable resource to be protected and managed.

3.37 Sites considered to be of national importance are scheduled by Scottish Ministers as Ancient Monuments. There are over 200 such sites in Angus with additional sites regularly being incorporated into the List. In addition, there are other monuments of regional or local significance. All of these sites and monuments, whether scheduled or not, are fragile and irreplaceable.

3.38 The owner or occupier of a scheduled ancient monument is required to obtain consent from Historic Scotland for repairs, alterations, demolition, or any work affecting the monument. In order therefore to protect the scheduled monument any planning application that may affect it will be notified to Historic Scotland and their comments taken into account in determining development proposals.

### **Policy ER18 : Archaeological Sites of National Importance**

**Priority will be given to preserving Scheduled Ancient Monuments in situ. Developments affecting Scheduled Ancient Monuments and other nationally significant archaeological sites and historic landscapes and their settings will only be permitted where it can be adequately demonstrated that either:**

- a) the proposed development will not result in damage to the scheduled monument or site of national archaeological interest or the integrity of its setting; or
- b) there is overriding and proven public interest to be gained from the proposed development that outweighs the national significance attached to the preservation of the monument or archaeological importance of the site. In the case of Scheduled Ancient Monuments, the development must be in the national interest in order to outweigh the national importance attached to their preservation; and
- c) the need for the development cannot reasonably be met in other less archaeologically damaging locations or by reasonable alternative means; and
- d) the proposal has been sited and designed to minimise damage to the archaeological remains.

Where development is considered acceptable and preservation of the site in its original location is not possible, the excavation and recording of the site will be required in advance of development, at the developer's expense.

### **NPPG 5: Planning and Archaeology (1994)**

*Sets out the role of the planning system in protecting ancient monuments and archaeological sites and landscapes. The Government seeks to encourage the preservation of our heritage of sites and landscapes of archaeological and historic interest. The development plan system provides the policy framework for meeting the need for development along with the need for preserving archaeological resources.*

### **PAN 42 : Archaeology – the Planning Process and Scheduled Monument Procedure (1994)**

*Archaeological remains offer a tangible, physical link with the past. They are a finite and non-renewable resource containing unique information about our past and the potential for an increase in future knowledge. Such remains are part of Scotland's identity and are valuable both for their own sake and for education, leisure and tourism. The remains are often fragile and vulnerable to damage or destruction; care must therefore be taken to ensure that they are not needlessly destroyed.*

### **Scheduled Ancient Monument (SAM):**

*The site of a scheduled monument and any other monument which in the opinion of the Scottish Ministers is of public interest by reason of its historic, architectural, traditional, artistic or archaeological interest.*

3.39 While the best examples of valuable archaeological sites are designated of national importance there are numerous examples of historic sites in both urban and rural areas that are of local significance. There are also other sites where finds may have been made in the past but no remains are known to date.

3.40 Within the mediaeval burghs of Arbroath, Brechin, Forfar and Montrose areas of primary and secondary archaeological significance were identified through the Scottish Burgh Surveys undertaken in the late 1970s. This provides an indicator for prospective developers that where redevelopment is being proposed an archaeological assessment may be required prior to commencement of works or at least a watching brief during excavations.

#### **Policy ER19 : Archaeological Sites of Local Importance**

**Where development proposals affect unscheduled sites of known or suspected archaeological interest, Angus Council will require the prospective developer to arrange for an archaeological evaluation to determine the importance of the site, its sensitivity to development and the most appropriate means for preserving or recording any archaeological information. The evaluation will be taken into account when determining whether planning permission should be granted with or without conditions or refused.**

**Where development is generally acceptable and preservation of archaeological features in situ is not feasible Angus Council will require through appropriate conditions attached to planning consents or through a Section 75 Agreement, that provision is made at the developer's expense for the excavation and recording of threatened features prior to development commencing.**

## Historic Gardens and Designed Landscapes

3.41 There are many fine examples of estates, parks and gardens, which help to form the landscape quality of Angus. The contribution of these historic and designed landscapes to the appearance of Tayside is recognised in the Tayside Landscape Character Assessment (1999).

3.42 Angus Council will seek to protect and enhance historic gardens and designed landscapes currently included in the Inventory of Gardens and Designed Landscapes in Scotland (1989), and any others that may be identified during the plan period as well as non-inventory sites of local or regional importance. Although it is recognised that non-inventory sites make an important contribution to the character of the landscape of Angus, further research is required to determine their number and location.

### ***Inventory of Gardens and Designed Landscapes in Scotland(1989):***

*A detailed list compiled by Historic Scotland and Scottish Natural Heritage as being of architectural or historic interest. Inventory sites in Angus include:*

*Airlie Castle  
Ascreavie  
Brechin Castle  
Cortachy Castle  
Edzell Castle  
Glamis Castle  
Guthrie Castle  
The Guynd  
House of Dun  
House of Pitmuies  
Kinnaird Castle*

### **Policy ER20 : Historic Gardens and Designed Landscapes**

**Sites included in the “Inventory of Gardens and Designed Landscapes in Scotland”, and any others that may be identified during the plan period, will be protected from development that adversely affects their character, amenity value and historic importance. Development proposals will only be permitted where it can be demonstrated that:**

- (a) the proposal will not significantly damage the essential characteristics of the garden and designed landscape or its setting; or**
- (b) there is a proven public interest, in allowing the development, which cannot be met in other less damaging locations or by reasonable alternative means.**

**Protection will also be given to non-inventory historic gardens, surviving features of designed landscapes, and parks of regional or local importance, including their setting.**

## Renewable Energy

3.72 The Scottish Executive is strongly supportive of renewable energies and has set a target of 17-18% of Scotland's electricity supply to come from renewable sources by 2010. NPPG6: Renewable Energy Developments (Revised 2000) considers a range of renewable energy technologies and encourages the provision of a positive policy framework to guide such developments. The Scottish Executive's aspiration is for renewable sources to contribute 40% of electricity production by 2020, an estimated total installed capacity of 6GW (Minister for Enterprise, July 2005). This will require major investment in commercial renewable energy production and distribution capacity throughout Scotland.

3.73 The Dundee and Angus Structure Plan acknowledges the advantages of renewable energy in principle but also recognises the potential concerns associated with development proposals in specific locations. Angus Council supports the principle of developing sources of renewable energy in appropriate locations. Large-scale developments will only be encouraged to locate in areas where both technical (e.g. distribution capacity and access roads) and environmental capacity can be demonstrated.

3.74 Developments which impinge on the Cairngorms National Park will be considered within the context of the National Park Authority's Planning Policy No1: Renewable Energy.

## Renewable Energy Sources

3.75 Offshore energy production, including wind and tidal methods, has the potential to make a significant contribution to the production of renewable energy in Scotland. Other than small-scale onshore support buildings, such developments currently fall outwith the remit of the planning system.

3.76 All renewable energy production, including from wind, water, biomass, waste incineration and sources using emissions from wastewater treatment works and landfill sites will require some processing, generating or transmission plant. Such developments, that can all contribute to reducing emissions will have an impact on the local environment and will be assessed in accordance with Policy ER34.

### Policy ER34 : Renewable Energy Developments

**Proposals for all forms of renewable energy development will be supported in principle and will be assessed against the following criteria:**

#### **NPPG6: Renewable Energy Developments (Revised 2000)**

*The Scottish Ministers wish to see the planning system make positive provision for renewable energy whilst at the same time:*

- *meeting the international and national statutory obligations to protect designated areas, species, and habitats of natural heritage interest and the historic environment from inappropriate forms of development; and*
- *minimising the effects on local communities.*

*Large-scale projects which may or will require an Environmental Assessment. These are defined as hydroelectric schemes designed to produce more than 0.5MW and wind farms of more than 2 turbines or where the hub height of any turbine or any other structure exceeds 15m.*

*SNH's EIA Handbook identifies 6 types of impact which may require an assessment:*

- *Landscape and visual;*
- *Ecological;*
- *Earth heritage;*
- *Soil;*
- *Countryside access; and*
- *Marine environment.*

- (a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
- (b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
- (c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
- (d) no unacceptable environmental effects of transmission lines, within and beyond the site; and
- (e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent and significant change to the environment and landscape.

## Wind Energy

3.77 Onshore wind power is likely to provide the greatest opportunity and challenge for developing renewable energy production in Angus. Wind energy developments vary in scale but, by their very nature and locational requirements, they have the potential to cause visual impact over long distances. Wind energy developments also raise a number of environmental issues and NPPG 6 advises that planning policies should guide developers to broad areas of search and to establish criteria against which to consider development proposals. In this respect, Scottish Natural Heritage Policy Statement 02/02, Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage, designates land throughout Scotland as being of high, medium or low sensitivity zones in terms of natural heritage. Locational guidance is provided to supplement the broad-brush zones.

3.78 A range of technical factors influence the potential for wind farm development in terms of location and viability. These include wind speed, access to the distribution network, consultation zones, communication masts, and proximity to radio and radar installations. Viability is essentially a matter for developers to determine although annual average wind speeds suitable for commercially viable generation have been recorded over most of Angus, other than for sheltered valley bottoms. Environmental implications will require to be assessed in conjunction with the Council, SNH and other parties as appropriate.

### **Strategic Locational Guidance for Onshore Windfarms in Respect of the Natural Heritage - Scottish Natural Heritage Policy Statement No 02/02**

**Zone 3** – high natural heritage sensitivity. Developers should be encouraged to look outwith Zone 3 for development opportunities

**Zone 2** – medium natural heritage sensitivity. ...while there is often scope for wind farm development within Zone 2 it may be restricted in scale and energy output and will require both careful choice of location and care in design to avoid natural heritage impacts.

**Zone 1** - ...inclusion of an area in Zone 1 does not imply absence of natural heritage interest. Good siting and design should however enable such localised interests to be respected, so that overall within Zone 1, natural heritage interests do not present a significant constraint on wind farm development



Figure 3.4 : Geographic Areas



**1 Highland**

**2 Lowland and Hills**

**3 Coast**

- TLCA Designation
- 1a Upper Highland Glens
  - 1b Mid Highland Glens
  - 3 Highland Summits & Plateaux
  - 5 Highland Foothills

- TLCA Designation
- 8 Igneous Hills
  - 10 Broad Valley Lowland
  - 12 Low Moorland Hills
  - 13 Dipslope Farmland

- TLCA Designation
- 14a Coast with sand
  - 14b Coast with cliffs
  - 15 Lowland Basin

3.79 Scottish Natural Heritage published a survey of Landscape Character, the Tayside Landscape Character Assessment (TLCA), which indicates Angus divides naturally into three broad geographic areas – the Highland, Lowland and hills and the Coast. The Tayside Landscape Character Assessment provides a classification to map these areas based on their own particular landscape characteristics (Fig 3.4).

<b>Area</b>	<b>TLCA Classification</b>	<b>Landscape Character</b>
1 Highland	1a, 1b, 3, 5	Plateaux summits, glens and complex fault line topography
2 Lowland and hills	8, 10, 12,13	Fertile strath, low hills and dipslope farmland.
3 Coast	14a, 14b, 15	Sand and cliff coast and tidal basin

The impact of wind farm proposals will, in terms of landscape character, be assessed against the TLCA classifications within the wider context of the zones identified in SNH Policy Statement 02/02.

3.80 The open exposed character of the Highland summits and the Coast (Areas 1 and 3) is sensitive to the potential landscape and visual impact of large turbines. The possibility of satisfactorily accommodating turbines in parts of these areas should not be discounted although locations associated with highland summits and plateaux, the fault line topography and coast are likely to be less suitable. The capacity of the landscape to absorb wind energy development varies. In all cases, the scale layout and quality of design of turbines will be an important factor in assessing the impact on the landscape.

3.81 The Highland and Coast also have significant natural heritage value, and are classified in SNH Policy Statement 02/02 as mainly Zone 2 or 3 - medium to high sensitivity. The development of large scale wind farms in these zones is likely to be limited due to potential adverse impact on their visual character, landscape and other natural heritage interests.

3.82 The Lowland and Hills (Area 2) comprises a broad swathe extending from the Highland boundary fault to the coastal plain. Much of this area is classified in Policy Statement 02/02 as Zone 1- lowest sensitivity. Nevertheless, within this wider area there are locally important examples of higher natural heritage sensitivity such as small- scale landscapes, skylines and habitats which will influence the location of wind turbines. In all cases, as advocated by SNH, good siting and design should show respect for localised interests.

3.83 Wind farm proposals can affect residential amenity, historic and archaeological sites and settings, and other economic and social activities including tourism. The impact of wind farm developments on these interests requires careful assessment in terms of sensitivity and scale so that the significance can be determined and taken into account.

3.84 Cumulative impact occurs where wind farms/turbines are

visually interrelated e.g. more than one wind farm is visible from a single point or sequentially in views from a road or a footpath. Landscape and visual impact can be exacerbated if wind turbines come to dominate an area or feature. Such features may extend across local authority, geographic or landscape boundaries and impact assessments should take this into account. Environmental impacts can also be subject to cumulative effect – for example where a number of turbine developments adversely affect landscape character, single species or habitat type.

3.85 SNH advise that an assessment of cumulative effects associated with a specific wind farm proposal should be limited to all existing and approved developments or undetermined Section 36 or planning applications in the public domain. The Council may consider that a pre-application proposal in the public domain is a material consideration and, as such, may decide it is appropriate to include it in a cumulative assessment. Similarly, projects outwith the 30km radius may exceptionally be regarded as material in a cumulative context.

#### **Policy ER35 : Wind Energy Development**

**Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:**

- (a) the reasons for site selection;**
- (b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;**
- (c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;**
- (d) that no wind turbines will interfere with authorised aircraft activity;**
- (e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;**
- (f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;**
- (g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.**

#### ***NPPG6 : Renewable Energy Developments (Revised 2000)***

*Large-scale projects which may or will require an Environmental Assessment. These are defined as hydroelectric schemes designed to produce more than 0.5MW and wind farms of more than 2 turbines or where the hub height of any turbine or any other structure exceeds 15m.*

#### **Local Community Benefit**

3.86 Where renewable energy schemes accord with policies in this local plan there may be opportunities to secure contributions from developers for community initiatives. Such contributions are not part of the planning process and as such will require to be managed through other means than obligations pursuant to Section 75 Planning Agreement. Community contributions are separate from planning gain and will not be considered as part of any planning application.

## Managing TAYplan's Assets: Safeguarding resources and land with potential to support the sustainable economic growth.

Delivering the vision and objectives of this Plan requires management of land and conservation of resources. This recognises that good quality development and the right type of development in the right places can lead to a series of social, economic and environmental benefits for those areas and the TAYplan region as a whole. This Plan balances these factors with the sometimes competing nature of different land uses.

This Plan safeguards for present and future generations important resources and land with potential to support the economy. It also requires us to ensure that development and growth in the economy occur in a way that does not place unacceptable burdens on environmental capacity and increase the exposure of users or inhabitants to risks. This can be achieved by directing development to specific locations (Policies 1, 4, 5, 6 and 7); ensuring that development is fit for place (Policies 2 and 8); and, that some areas or assets are safeguarded for a specific range of land uses (Policy 3).

This is important to support the growth of emerging sectors of the economy, such as the off-shore renewable energy sector through the protection of the region's ports for port-related uses, particularly Dundee and Montrose Ports. Similarly employment land, particularly in rural areas, can be affected through redevelopment for alternative uses or by alternative uses nearby. This could hinder or even prevent the start up of businesses in the future and/or limit business operations.

The economic recovery of the region and new development will need to be supported by appropriate infrastructure, particularly transport infrastructure. This will also contribute to behavioural change and reducing reliance on the car and on road-based freight. Ensuring that this can be delivered will require land and routes to be protected from prejudicial development. It also requires the public and private sectors to work jointly to deliver infrastructure.

Supporting future food and resource security will require the protection of finite resources like minerals, forestry and prime agricultural land\* by management as one consideration in the prioritisation of land release under Policy 1.

Limiting the types of land uses that can occur within green belts at Perth and St. Andrews will contribute to protecting the settings and historic cores of those settlements from inappropriate development and prevent coalescence with neighbouring areas.

It is essential to grow the economy within environmental limits and build-in resilience to climate change, natural processes and increased risk from sea level rise. Identifying environmentally sensitive areas and important natural and historic assets where no or very limited development would be permitted, such as some coastal areas, Natura 2000\*\* sites and other locations, will contribute to this. It will also be important to ensure that plans for managed realignment of coast and other coastal management are devised in liaison with Scottish Natural Heritage and Marine Scotland.



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\*Prime agricultural land: Land classes 1, 2 and 3.1 – these are the most suited to arable agriculture.

\*\*Natura 2000: European-wide designations to protect habitats and species – special protection areas (SPAs), Ramsar sites and special areas of conservation (SACs)



## Policy 3: Managing TAYplan's Assets

- identifying and safeguarding at least 5 years supply of employment land within principal settlements to support the growth of the economy and a diverse range of industrial requirements;
- safeguarding areas identified for class 4 office type uses in principal settlements; and,
- further assisting in growing the year-round role of the tourism sector.

- continuing to designate green belt boundaries at both St. Andrews and Perth to preserve their settings, views and special character including their historic cores; assist in safeguarding the countryside from encroachment; to manage long term planned growth including infrastructure in this Plan's Proposals Map and Strategic Development Areas in Policy 4; and define appropriate forms of development within the green belt based on Scottish Planning Policy;

Perth Core Area



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- using Perth green belt to sustain the identity of Scone, and provide sufficient land for planned development around key villages and settlements.

using the location priorities set out in Policy 1 of this Plan to:

- safeguard minerals deposits of economic importance and land for a minimum of 10 years supply of construction aggregates at all times in all market areas; and,
- protect prime agricultural land, new and existing forestry areas, and carbon rich soils (where identified) where the advantages of development do not outweigh the loss of productive land.

Employment Land

Greenbelts

Natural and Historic Assets\*

Land should be identified through Local Development Plans to ensure responsible management of TAYplan's assets by:

Transport

Finite Resources

Understanding and respecting the regional distinctiveness and scenic value of the TAYplan area through:

- ensuring development likely to have a significant effect on a designated or proposed Natura 2000 sites (either alone or in combination with other sites or projects), will be subject to an appropriate assessment. Appropriate mitigation requires to be identified where necessary to ensure there will be no adverse effect on the integrity of Natura 2000 sites in accordance with Scottish Planning Policy;
- safeguarding habitats, sensitive green spaces, forestry, watercourses, wetlands, floodplains (in-line with the water framework directive), carbon sinks, species and wildlife corridors, geodiversity, landscapes, parks, townscapes, archaeology, historic buildings and monuments and allow development where it does not adversely impact upon or preferably enhances these assets; and,
- identifying and safeguarding parts of the undeveloped coastline along the River Tay Estuary and in Angus and North Fife, that are unsuitable for development and set out policies for their management; identifying areas at risk from flooding and sea level rise and develop policies to manage retreat and realignment, as appropriate.

- safeguarding land at Dundee and Montrose Ports, and other harbours, as appropriate, for port related uses to support freight, economic growth and tourism; and,
- safeguarding land for future infrastructure provision (including routes), identified in the Proposal Map of this Plan or other locations or routes, as appropriate, or which is integral to a Strategic Development Area in Policy 4 of this Plan, or which is essential to support a shift from reliance on the car and road-based freight and support resource management objectives.

\*Natural and historic assets: Landscapes, habitats, wildlife sites and corridors, vegetation, biodiversity, green spaces, geological features, water courses and ancient monuments, archaeological sites and landscape, historic buildings, townscapes, parks, gardens and other designed landscapes, and other features (this includes but is not restricted to designated buildings or areas).

**Energy and Waste/Resource Management Infrastructure: Ensures that energy and waste/resource management infrastructure are in the most appropriate locations.**

This Plan seeks to reduce resource consumption through provision of energy and waste/resource management infrastructure\* in order to contribute to Scottish Government ambitions for the mitigation of and adaptation to climate change and to achieve zero waste. It also aims to contribute towards greater regional energy self-sufficiency.

This requires us to use less energy and to generate more power and heat from renewable sources and resource recovery; and, to consider waste from start to finish; becoming better at resource management. This is strongly tied into resource security and living within environmental limits. It also presents opportunities to grow the renewable energy and waste/resource management sector as a whole within the TAYplan region. The issue is no longer about whether such facilities are needed but instead about helping to ensure they are delivered in the most appropriate locations.

Land use planning is only one of the regulatory requirements that energy and waste/resource management operators must consider. This Plan does not provide the locations for energy infrastructure; this role is for Local Development Plans. It sets out a series of locational considerations for all energy and waste/resource management infrastructure as the impacts and operations of these share similar characteristics.

This Plan ensures consistency between Local Development Plans in fulfilling Scottish Planning Policy requirements to define areas of search for renewable energy infrastructure and it applies this to a wide range of energy and waste/resource management infrastructure.

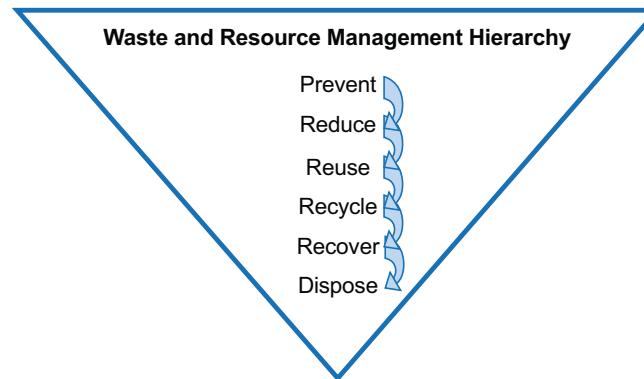
It recognises the different scales – property (eg micro-renewables or individual waste facilities), community (eg district heating and power or local waste facilities) and regional/national (eg national level schemes and waste facilities for wide areas) at which this infrastructure can be provided and both the individual and cumulative contribution that can be made, particularly by community and property scale infrastructure, to Scottish Government objectives for greater decentralisation of heat and energy.

Changes in the law allowing surplus power to be sold back to the national grid and other incentives could stimulate interest from local authorities, businesses, householders, community land trusts and other groups to obtain loans for energy infrastructure to enable development to meet local or individual needs in future. Similarly the price of materials in the global market place may continue to stimulate business interests in resource recovery.

Many of the region’s existing waste management facilities have additional capacity or could be expanded in situ, including the strategic scale facilities at Binn Farm near Glenfarg and DERL at Baldovie in Dundee. No requirement for new landfill sites has been identified before 2024 and successful implementation of the Scottish Government’s Zero Waste Plan and expansion of other treatment facilities could extend this to and beyond 2032.

This Plan encourages new strategic scale waste/resource management infrastructure to be within or close to the Dundee and Perth Core Areas reflecting the proximity of materials and customers for heat and other products.

Modern waste/resource management infrastructure is designed and regulated to high standards and is similar to other industrial processes. Subject to detailed site specific considerations, waste management facilities can be considered appropriate land uses within industrial and employment sites.



\*Energy and waste management infrastructure: Infrastructure for heat and power generation and transmission; and, collection, separation, handling, transfer, processing, resource recovery and disposal of waste. This includes recycling plants, anaerobic waste digesters, energy from waste plants, wind turbines, biomass plants, combined heat and power plants, solar power, hydro electric power plants and similar facilities.



## Policy 6: Energy and Waste/Resource Management Infrastructure

To deliver a low/zero carbon future and contribute to meeting Scottish Government energy and waste targets:

**A. Local Development Plans should** identify areas that are suitable for different forms of renewable heat and electricity infrastructure and for waste/resource management infrastructure or criteria to support this; including, where appropriate, land for process industries (e.g. the co-location/proximity of surplus heat producers with heat users).

**B.** Beyond community or small scale facilities waste/resource management infrastructure is most likely to be focussed within or close to the Dundee and/or Perth Core Areas (identified in Policy 1).

**C. Local Development Plans and development proposals should** ensure that all areas of search, allocated sites, routes and decisions on development proposals for energy and waste/resource management infrastructure have been justified, at a minimum, on the basis of these considerations:

- The specific land take requirements associated with the infrastructure technology and associated statutory safety exclusion zones where appropriate;
- Waste/resource management proposals are justified against the Scottish Government's Zero Waste Plan and support the delivery of the waste/resource management hierarchy;
- Proximity of resources (e.g. woodland, wind or waste material); and to users/customers, grid connections and distribution networks for the heat, power or physical materials and waste products, where appropriate;
- Anticipated effects of construction and operation on air quality, emissions, noise, odour, surface and ground water pollution, drainage, waste disposal, radar installations and flight paths, and, of nuisance impacts on off-site properties;
- Sensitivity of landscapes (informed by landscape character assessments and other work), the water environment, biodiversity, geo-diversity, habitats, tourism, recreational access and listed/scheduled buildings and structures;
- Impacts of associated new grid connections and distribution or access infrastructure;
- Cumulative impacts of the scale and massing of multiple developments, including existing infrastructure;
- Impacts upon neighbouring planning authorities (both within and outwith TAYplan); and,
- Consistency with the National Planning Framework and its Action Programme.



# Memorandum

Communities  
(Roads)

TO: HEAD OF PLANNING & PLACE

FROM: HEAD OF TECHNICAL & PROPERTY SERVICES

YOUR REF:

OUR REF: GH/AG/CM TD1.3

DATE: 20 JANUARY 2015

**SUBJECT: PLANNING APPLICATION REF. NO. 14/01067/FULL – PROPOSED 77m WIND TURBINE AT ELLIOT INDUSTRIAL ESTATE, ARBROATH FOR BAIRDS MALT SINGLE TURBINE LTD**

---

I refer to the above planning application.

The site is located at the south east corner of the existing Bairds Malts site within Elliot Industrial Estate, Peasiehill Road, Arbroath.

The applicant has submitted an Environmental Report which states that the turbines will be landed at Montrose and then transported south to the site via the A92 Dundee – Montrose road, Westway and Peasiehill Road.

I have considered the application in terms of the traffic likely to be generated by it, and its impact on the public road network. As a result, I do not object to the application but would recommend that any consent granted shall be subject to the following condition:

- 1 That, prior to the commencement of development, a Construction Traffic Management and Routing Plan shall be submitted for the written approval of the Planning Authority. Thereafter, the development shall be undertaken in accordance with the approved details of the plan. The Construction Traffic Management and Routing Plan shall consider arrangements for the following:
  - (i) agreement with the Roads Authority on the routing for abnormal loads;
  - (ii) the type and volume of vehicles to be utilised in the delivery to the site of construction materials and turbine components associated with the construction and erection of the wind turbines;

- (iii) assessment of the suitability of the proposed routes, including bridge capacities, to accommodate the type and volume of traffic to be generated by the development. The assessment shall include details of swept path analyses and include DVD video route surveys;
- (iv) any proposed accommodation works / mitigating measures affecting the public roads in order to allow for delivery loads including carriageway widening, junction alterations, associated drainage works, protection to public utilities, temporary or permanent traffic management signing, and temporary relocation or removal of other items of street furniture;
- (v) the restriction of delivery traffic to agreed routes;
- (vi) the timing of construction traffic to minimise impacts on local communities, particularly at school start and finish times, during refuse collection, at weekends and during community events;
- (vii) a code of conduct for HGV drivers to allow for queuing traffic to pass;
- (viii) liaison with the roads authority regarding winter maintenance;
- (ix) contingency procedures, including names and telephone numbers of persons responsible, for dealing with vehicle breakdowns;
- (x) a dust and dirt management strategy, including sheeting and wheel cleaning prior to departure from the site;
- (xi) the location, design, erection and maintenance of warning/information signs for the duration of the works, at site accesses and crossovers on private haul roads or tracks used by construction traffic and pedestrians, cyclists or equestrians;
- (xii) contingencies for unobstructed access for emergency services;
- (xiii) co-ordination with other major commercial users of the public roads on the agreed routes in the vicinity of the site;
- (xiv) traffic management, in the vicinity of temporary construction compounds;
- (xv) arrangements for the monitoring, reviewing and reporting on the implementation of the approved plan; and
- (xvi) procedures for dealing with non-compliance with the approved plan.

*Reason: to ensure the free flow of traffic in the interests of road safety, for the convenience of road users and to ensure that any works required to the local road network to facilitate the development are undertaken.*

I trust the above comments are of assistance but should you have any further queries, please contact Adrian Gwynne on extension 3393.

*p.p.*



## Defence Infrastructure Organisation

Miss Rachel Evans  
Assistant Safeguarding Officer  
Ministry of Defence  
Safeguarding – Wind Energy  
Kingston Road  
Sutton Coldfield  
West Midlands B75 7RL  
United Kingdom

**Your Reference: 14/01067/FULL**

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**Our Reference: 21802**

E-mail: [DIOODC-IPSSG3a@mod.uk](mailto:DIOODC-IPSSG3a@mod.uk)

Mr David Gray  
Angus Council  
County Buildings  
Market Street  
Forfar  
DD8 3LG

22<sup>nd</sup> January 2015

Dear Mr Gray

**Please quote in any correspondence: 21802**

**Site Name: Maltings**

**Planning Application Number: 14/01067/FULL**

**Site Address: Peasiehill Road, Elliot Industrial Estate, Arbroath, DD11 2NJ**

Thank you for consulting the Ministry of Defence (MOD) about the above planning application in your communication dated 9<sup>th</sup> January 2015.

I am writing to inform you that the MOD objects to the proposal. Our assessment has been carried out on the basis that there will be 1 turbine, 77 metres in height from ground level to blade tip and located at the grid reference below as stated in the planning application or provided by the developer:

Turbine	100km Square letter	Easting	Northing
1	NO	61828	40071

### **Air Traffic Control (ATC) Radar**

The turbine will be 24.18 km from, detectable by, and will cause unacceptable interference to the ATC radar at RAF Leuchars.

Wind turbines have been shown to have detrimental effects on the performance of MOD ATC and Range Control radars. These effects include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns which air traffic controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence both military and civilian aircraft, and in busy uncontrolled airspace radar is the only sure way to do this safely. Maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient air traffic service, and the integrity of radar data is central to this process. The creation of "false" aircraft displayed on the radar leads to increased workload for both controllers and aircrews,

and may have a significant operational impact. Furthermore, real aircraft returns can be obscured by the turbine's radar returns, making the tracking of conflicting unknown aircraft (the controllers' own traffic) much more difficult.

If the developer is able to overcome the issues stated above, the MOD will request that the turbine is fitted with 25 candela omni-directional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point.

MOD Safeguarding wishes to be consulted and notified about the progress of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

I hope this adequately explains our position on the matter. Further information about the effects of wind turbines on MOD interests can be obtained from the following website:

**MOD:** <https://www.gov.uk/government/publications/wind-farms-ministry-of-defence-safeguarding>

Yours sincerely



Miss Rachel Evans  
Assistant Safeguarding Officer – Wind Energy  
Defence Infrastructure Organisation

**SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS**





## Defence Infrastructure Organisation

Your Ref. 14/01067/FUL  
DIO Ref. DE/C/SUT/43/10/1/21802

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Mr David Gray

Via Email

Angus Council

19 May 2015

Dear Mr Gray,

### **Maltings wind turbine at Peasihall Road, Elliot Industrial Estate, Arbroath, DD11 2NJ**

The Ministry of Defence (MOD) objected to the above application in the letter to Angus Council dated 22<sup>nd</sup> January 2015.

The MOD objected on the grounds that the proposed development would have an adverse impact upon the Air Traffic Control radars at RAF Leuchars. The MOD noted that if the developer is able to overcome these unacceptable impacts that the turbines should be fitted with appropriate aviation lighting.

As you may be aware, the MOD has been in discussions with the aviation consultant working on behalf of the applicant since the submission of this objection letter with a view to reaching agreement on appropriate mitigation to address the unacceptable impacts of this development. The updated MOD position is set out below:

### **RAF Leuchars**

Wind Business Support Ltd on behalf of the applicant submitted a technical proposal to mitigate the unacceptable affects of the proposed development on the Air Traffic Control (ATC) radar at RAF Leuchars. The proposal has been accepted by the MOD, and a planning condition has been agreed with the applicant. A draft is included at Annex A for the Council's consideration.

Please note that the MOD is unaware of any proposed mitigation schemes within the military ATC environment which have been successfully implemented to date. You may be aware that the MOD has undertaken a Technology Demonstration (TD) programme of potential mitigation solutions during the summer of 2013. The TD reported in January 2014, and the next steps were articulated in the MOD's response to the National Infrastructure Plan in March 2014.

The MOD continues to proactively seek a solution. During 2014 the MOD worked with wind farm developers to find a way forward that was acceptable to all parties. It is anticipated that this work will culminate in one or more contracts to assess mitigation solution provider(s) over a longer period in order to prove a technical solution that meets the MOD requirement for mitigating wind turbines on

ATC radars. The exact details of how this will be funded and how the work will be carried out will be finalised in 2015.

## Aviation Lighting

In the objection letter of 22<sup>nd</sup> January 2015, the MOD identified that if the developer is able to overcome the radar issue, the MOD will request that *'the turbine is fitted with 25 candela omnidirectional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point'*. The MOD has agreed a planning condition with the applicant and a draft is included in Annex A for the Council's consideration.

In light of the above, the MOD would be prepared to remove its objection to this application subject to appropriate conditions being imposed upon the consent, if granted. Should the Council be minded to amend any of the conditions in Annex A, the MOD would welcome the opportunity to discuss these amendments with the Council.

If planning permission is granted, the MOD would like to be advised of the following information;

- The date construction starts and ends;
- The maximum height of construction equipment;
- The latitude and longitude of the turbine erected

Please do not hesitate to contact me should you require any additional information, or should you wish to discuss matters.

Yours faithfully



Marie Neenan  
Senior Safeguarding Officer

Enc. Annex A



## Annex A

### Air Traffic Control radar

No development shall commence unless and until an Air Traffic Control Radar Mitigation Scheme to address the impact of the wind turbine upon air safety has been submitted to and approved in writing by the Local Planning Authority.

The Air Traffic Control Radar Mitigation Scheme is a scheme designed to mitigate the impact of the development upon the operation of the Primary Surveillance Radar at RAF Leuchars ("the Radar") and the air traffic control operations of the Ministry of Defence (MOD) which is reliant upon the Radar. The Air Traffic Control Radar Mitigation Scheme shall set out the appropriate measures to be implemented to mitigate the impact of the development on the Radar and shall be in place for the operational life of the development provided the Radar remains in operation.

No turbines shall become operational unless and until all those measures required by the approved Air Traffic Control Radar Mitigation Scheme to be implemented prior to the operation of the turbines have been implemented and the Local Planning Authority has confirmed this in writing. The development shall thereafter be operated fully in accordance with the approved Air Traffic Control Radar Mitigation Scheme.

### Aviation Lighting

The Company shall install MOD-accredited 25 candela omni-directional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point. The turbine will be erected with this lighting installed and the lighting will remain operational throughout the duration of this consent.

**TaylorE**

---

**From:** ThomsonSD  
**Sent:** 13 January 2016 15:19  
**To:** TaylorE  
**Cc:** MilneAJ  
**Subject:** 14/01067/FULL Proposed wind turbine Baird's Malt Arbroath  
**Attachments:** Bairds Malt Turbine Supporting information v2.1.pdf; Bairds Malt Turbine Addendum v1.0.pdf; Bairds\_Zones.pdf

Dear Ed I refer to the above application and previous correspondence regarding the same;

As you are aware this service objected to the above application due to concerns about the information provided by the applicants in terms of both noise and shadow flicker. Further information has now been submitted in respect of both these issues and taking these into consideration I would advise further as follows;

#### Operational wind turbine noise.

The applicants consultant has submitted additional supporting information by e-mail dated 12 January 2016 and a noise assessment addendum again by e-mail dated 17 December 2015 (copies attached above for information)

Together these have addressed the issues raised in my consultation response dated 17<sup>th</sup> April 2015 and in addition the applicants agent has also looked at the potential impact of seasonal changes in background plant noise due to non-operation of the steep fans. A revised assessment including a slight reduction of certain derived noise limits has been carried out and this has demonstrated that operational turbine noise is predicted to be well within the revised limits.

Taking all the submitted information into consideration I am now satisfied that the methodology used for the assessment follows the appropriate guidance for this type of development and therefore I would not object to this application on the grounds of noise subject to appropriate conditions being attached to any permission. To this end I attach below draft conditions for your consideration. In addition to these I would also recommend that as the derived noise limits are heavily influenced by the existing factory noise consideration should be given to a further condition which would seek to prohibit the operation of the turbine should existing processes cease.

#### Shadow Flicker

The applicants consultant has submitted a revised shadow flicker assessment by e-mail dated 6<sup>th</sup> August 2015 which meets with the requirements of this service and demonstrates that any impact caused by shadow flicker should be capable of being mitigated to a satisfactory level. Accordingly this service would not object to this application on the grounds of shadow flicker subject to an appropriate condition being attached to any permission and I include a draft condition for your consideration below.

If you have any queries please do not hesitate to contact me.

Regards  
steve

Draft conditions

1. The rating level of noise immissions from the wind turbine (including the application of any tonal penalty) when determined in accordance with the attached Guidance Notes (to this condition), shall not exceed at any property lawfully existing at the date of this planning permission

(a) the  $L_{A90}$  dB (A) 10min levels, shown in tables A & B, during the respective periods described in these tables; where there is more than one property at a location the noise limits apply to all properties at that location or

(b)  $L_{A90}$  35dB (A) 10min at wind speeds up to 10 m/s at 10m height at any other location.

The zones referred to in tables A and B below are delineated on the attached plan reference: 14/01067/FULL Baird's Malt Arbroath table A and B zones

2. Prior to the commencement of development the make and model of the turbine selected for use in the development shall be submitted for the written approval of the Planning Authority.
3. Prior to the commencement of development, where any turbine other than the candidate turbine is to be installed, a detailed noise assessment, including where necessary a cumulative assessment taking into account any existing wind turbine developments approved prior to the date of this permission, demonstrating that the noise limits specified by this permission shall not be exceeded shall be submitted for the written approval of the Planning Authority.
4. Prior to the commencement of development, where any wind turbine is required to operate in a reduced power mode in order to comply with the noise limits specified by this permission a scheme for the mitigation of noise shall be submitted for the written approval of the Planning Authority.
5. The wind farm operator shall continuously log power production, wind speed and wind direction, all in accordance with Guidance Note 1(d). This data shall be retained for a period of not less than 24 months. The wind farm operator shall provide this information in the format set out in Guidance Note 1(e) to the Local Planning Authority on its request, within 14 days of receipt in writing of such a request.
6. No electricity shall be exported until the wind farm operator has submitted to the Local Planning Authority for written approval a list of proposed independent consultants who may undertake noise compliance measurements in accordance with this permission. Amendments to the list of approved consultants shall be made only with the prior written approval of the Local Planning Authority.
7. Within 21 days from receipt of a written request from the Local Planning Authority following a complaint to it from an occupant of a dwelling alleging noise disturbance at that dwelling, the wind farm operator shall, at its expense, employ a consultant approved by the Local Planning Authority to assess the level of noise immissions from the wind farm at the complainant's property in accordance with the procedures described in the attached Guidance Notes. The written request from the Local Planning Authority shall set out at least the date, time and location that the complaint relates to and any identified atmospheric conditions, including wind direction, and include a statement as to whether, in the opinion of the Local Planning Authority, the noise giving rise to the complaint contains or is likely to contain a tonal component.
8. The assessment of the rating level of noise immissions shall be undertaken in accordance with an assessment protocol that shall previously have been submitted to and approved in writing by the Local Planning Authority. The protocol shall include the proposed measurement location identified in accordance with the Guidance Notes where measurements for compliance checking purposes shall be undertaken, whether noise giving rise to the complaint contains or is likely to contain a tonal component, and also the range of meteorological and operational conditions (which shall include the range of wind speeds, wind directions, power generation and times of day) to determine the assessment of rating level of noise immissions. The proposed range of conditions shall be those which prevailed during times when the complainant alleges there was disturbance due to noise, having regard to the written request by the Local Planning Authority to investigate a complaint, and such others as the independent consultant considers likely to result in a breach of the noise limits.

9. Where a dwelling to which a complaint is related is not listed in the tables attached to these conditions, the wind farm operator shall submit to the Local Planning Authority for written approval proposed noise limits to be adopted at the complainant's dwelling for compliance checking purposes. The proposed noise limits are to be those limits selected from the Tables specified for a listed location which the independent consultant considers as being likely to experience the most similar background noise environment to that experienced at the complainant's dwelling. The rating level of noise immissions resulting from the combined effects of the wind turbines when determined in accordance with the attached Guidance Notes shall not exceed the noise limits approved in writing by the Local Planning Authority for the complainant's dwelling.
10. The wind farm operator shall provide to the Local Planning Authority the independent consultant's assessment of the rating level of noise immissions undertaken in accordance with the Guidance Notes within 2 months of the date of the written request of the Local Planning Authority for compliance measurements to be undertaken, unless the time limit is extended in writing by the Local Planning Authority. The assessment shall include all data collected for the purposes of undertaking the compliance measurements, such data to be provided in the format set out in Guidance Note 1(e) of the Guidance Notes. The instrumentation used to undertake the measurements shall be calibrated in accordance with Guidance Note 1(a) and certificates of calibration shall be submitted to the Local Planning Authority with the independent consultant's assessment of the rating level of noise immissions.
11. Where a further assessment of the rating level of noise immissions from the wind farm is required pursuant to Guidance Note 4(c), the wind farm operator shall submit a copy of the further assessment within 21 days of submission of the independent consultant's assessment pursuant to condition 8 above unless the time limit has been extended in writing by the Local Planning Authority.
12. In the event that noise emissions from the wind turbine exceed the levels set by this permission, operation of the turbine shall cease until measures to reduce noise levels to comply with this permission are implemented. Should such measures fail to achieve compliance with the noise levels set by this permission the operation of the turbine shall cease until otherwise approved in writing by the planning authority.
13. Prior to the commencement of development a shadow flicker assessment shall be submitted for the written approval of the Planning Authority. The aforementioned assessment shall consider any sensitive receptors a minimum of 1km from any proposed turbine. Where under worst case conditions any property is predicted to be affected by shadow flicker for more than 30 minutes per day or more than 30 hours per year then a scheme of mitigation shall be submitted for the written approval of the Planning Authority. Once approved the operation of the wind farm shall take place in accordance with the said scheme unless the Planning Authority gives written consent to any variation. For the avoidance of doubt sensitive receptors includes all residential properties, hospitals, schools and office buildings.

**Table A: Operational wind turbine noise between 2300hrs – 0700hrs**

Location	Standardised 10m Height Wind Speed m/s								
	4	5	6	7	8	9	10	11	12
Peasiehill Cottages	48.4	48.4	48.7	49.4	50.4	51.8	53.6	55.6	57.8
Patrick Allan Fraser street Zone 1	44.3	45.3	46.2	47.3	49.0	50.9	53.1	54.9	56
Kinghorne street Zone 2	42.4	43.2	43.9	44.8	46.2	47.7	49.5	51.3	52.8
Gerrard Place Zone 3	39.1	41.3	43.0	44.7	46.3	48.0	49.7	51.3	52.6
Elliot Caravan site	39.1	41.3	43.0	44.7	46.3	48.0	49.7	51.3	52.6

**Table B: Operational wind turbine noise at all other times**

Location	Standardised 10m Height Wind Speed m/s								
	4	5	6	7	8	9	10	11	12
Peasiehill Cottages	50.2	50.2	50.4	51.2	52.2	53.7	55.2	56.8	58.4
Patrick Allan Fraser street Zone 1	44.8	45.4	46.5	47.9	49.5	51.4	53.3	55.1	56.7
Kinghorne street Zone 2	43.3	44.2	45.2	46.3	47.8	49.3	50.9	52.2	53.5
Gerrard Place Zone 3	42.4	43.8	45.1	46.4	47.6	49.1	50.7	52.1	53.4
Elliot Caravan site	42.4	43.8	45.1	46.4	47.6	49.1	50.7	52.1	53.4

**Guidance Notes for Noise Conditions**

These notes are to be read with and form part of the noise condition. They further explain the condition and specify the methods to be employed in the assessment of complaints about noise immissions from the wind farm. The rating level at each integer wind speed is the arithmetic sum of the wind farm noise level as determined from the best-fit curve described in Guidance Note 2 of these Guidance Notes and any tonal penalty applied in accordance with Guidance Note 3. Reference to ETSU-R-97 refers to the publication entitled "The Assessment and Rating of Noise from Wind Farms" (1997) published by the Energy Technology Support Unit (ETSU) for the Department of Trade and Industry (DTI).

**Guidance Note 1**

(a) Values of the LA90,10 minute noise statistic should be measured at the complainant's property, using a sound level meter of EN 60651/BS EN 60804 Type 1, or BS EN 61672 Class 1 quality (or the equivalent UK adopted standard in force at the time of the measurements) set to measure using the fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). This should be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent UK adopted standard in force at the time of the measurements). Measurements shall be undertaken in such a manner to enable a tonal penalty to be applied in accordance with Guidance Note 3.

(b) The microphone should be mounted at 1.2 – 1.5 metres above ground level, fitted with a two-layer windshield or suitable equivalent approved in writing by the Local Planning Authority, and placed outside the complainant's dwelling. Measurements should be made in "free field" conditions. To achieve this, the microphone should be placed at least 3.5 metres away from the building facade or any reflecting surface except the ground at the approved measurement location. In the event that the consent of the complainant for access to his or her property to undertake compliance measurements is withheld, the wind farm operator shall submit for the written approval of the Local Planning Authority details of the proposed alternative representative measurement location prior to the commencement of measurements and the measurements shall be undertaken at the approved alternative representative measurement location.

(c) The LA90,10 minute measurements should be synchronised with measurements of the 10-minute arithmetic mean wind and operational data logged in accordance with Guidance Note 1(d), including the power generation data from the turbine control systems of the wind farm.

(d) To enable compliance with the conditions to be evaluated, the wind farm operator shall continuously log arithmetic mean wind speed in metres per second and wind direction in degrees from north at hub height for each turbine and arithmetic mean power generated by each turbine, all in successive 10-minute periods. Unless an alternative procedure is previously agreed in writing with the Planning Authority, this hub height wind speed, averaged across all operating wind turbines, shall be used as the basis for the analysis. All 10 minute arithmetic average mean wind speed data measured at hub height shall be 'standardised' to

a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres . It is this standardised 10 metre height wind speed data, which is correlated with the noise measurements determined as valid in accordance with Guidance Note 2, such correlation to be undertaken in the manner described in Guidance Note 2. All 10-minute periods shall commence on the hour and in 10- minute increments thereafter.

(e) Data provided to the Local Planning Authority in accordance with the noise condition shall be provided in comma separated values in electronic format.

(f) A data logging rain gauge shall be installed in the course of the assessment of the levels of noise immissions. The gauge shall record over successive 10-minute periods synchronised with the periods of data recorded in accordance with Note 1(d).

## **Guidance Note 2**

(a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Guidance Note 2 (b)

(b) Valid data points are those measured in the conditions specified in the agreed written assessment protocol, but excluding any periods of rainfall measured in the vicinity of the sound level meter. Rainfall shall be assessed by use of a rain gauge that shall log the occurrence of rainfall in each 10 minute period concurrent with the measurement periods set out in Guidance Note 1. In specifying such conditions the Local Planning Authority shall have regard to those conditions which prevailed during times when the complainant alleges there was disturbance due to noise or which are considered likely to result in a breach of the limits.

(c) For those data points considered valid in accordance with Guidance Note 2(b), values of the LA90,10 minute noise measurements and corresponding values of the 10- minute wind speed, as derived from the standardised ten metre height wind speed averaged across all operating wind turbines using the procedure specified in Guidance Note 1(d), shall be plotted on an XY chart with noise level on the Y-axis and the standardised mean wind speed on the X-axis. A least squares, "best fit" curve of an order deemed appropriate by the independent consultant (but which may not be higher than a fourth order) should be fitted to the data points and define the wind farm noise level at each integer speed.

## **Guidance Note 3**

(a) Where, in accordance with the approved assessment protocol, noise immissions at the location or locations where compliance measurements are being undertaken contain or are likely to contain a tonal component, a tonal penalty is to be calculated and applied using the following rating procedure.

(b) For each 10 minute interval for which LA90,10 minute data have been determined as valid in accordance with Guidance Note 2 a tonal assessment shall be performed on noise immissions during 2 minutes of each 10 minute period. The 2 minute periods should be spaced at 10 minute intervals provided that uninterrupted uncorrupted data are available ("the standard procedure"). Where uncorrupted data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from the standard procedure, as described in Section 2.1 on pages 104-109 of ETSU-R-97, shall be reported.

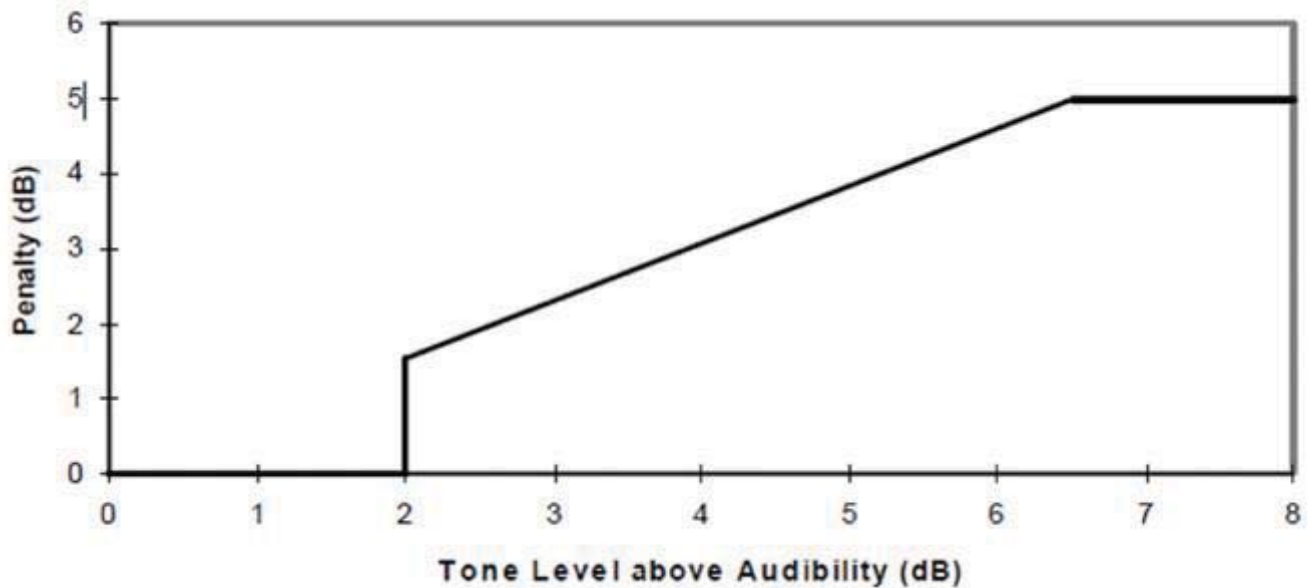
(c) For each of the 2 minute samples the tone level above or below audibility shall be calculated by comparison with the audibility criterion given in Section 2.1 on pages 104-109 of ETSU-R-97.

(d) The tone level above audibility shall be plotted against wind speed for each of the 2 minute samples. Samples for which the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be used.

(e) A least squares "best fit" linear regression line shall then be performed to establish the average tone level above audibility for each integer wind speed derived from the value of the "best fit" line at each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic mean shall be used. This process shall be repeated for each integer wind speed for which there is an assessment of overall levels in Guidance Note 2.



(f) The tonal penalty is derived from the margin above audibility of the tone according to the figure below.



#### Guidance Note 4

(a) If a tonal penalty is to be applied in accordance with Guidance Note 3 the rating level of the turbine noise at each wind speed is the arithmetic sum of the measured noise level as determined from the best fit curve described in Guidance Note 2 and the penalty for tonal noise as derived in accordance with Guidance Note 3 at each integer wind speed within the range specified by the agreed written assessment protocol.

(b) If no tonal penalty is to be applied then the rating level of the turbine noise at each wind speed is equal to the measured noise level as determined from the best fit curve described in Guidance Note 2.

(c) In the event that the rating level is above the limit(s) set out in the Tables attached to the noise conditions or the noise limits for a complainant's dwelling, the independent consultant shall undertake a further assessment of the rating level to correct for background noise so that the rating level relates to wind turbine noise immission only.

(d) The wind farm operator shall ensure that all the wind turbines in the development are turned off for such period as the independent consultant requires to undertake the further assessment. The further assessment shall be undertaken in accordance with the following steps:

(e). Repeating the steps in Guidance Note 2, with the wind farm switched off, and determining the background noise (L3) at each integer wind speed within the range requested by the Local Planning Authority in its written request and the approved protocol.

(f) The wind farm noise (L1) at this speed shall then be calculated as follows where L2 is the measured level with turbines running but without the addition of any tonal penalty:



$$L_1 = 10 \log \left[ 10^{\frac{L_2}{10}} - 10^I \right]$$

(g) The rating level shall be re-calculated by adding arithmetically the tonal penalty (if any is applied in accordance with Note 3) to the derived wind farm noise L1 at that integer wind speed.

(h) If the rating level after adjustment for background noise contribution and adjustment for tonal penalty (if required in accordance with note 3 above) at any integer wind speed lies at or below the values set out in the Tables attached to the conditions or at or below the noise limits approved by the Local Planning Authority for a complainant's dwelling then no further action is necessary. If the rating level at any integer wind speed exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling then the development fails to comply with the conditions.

Steven Thomson Senior EHO Regulatory & Protective Services, Communities, County Buildings Angus Council, County Buildings, Market Street, Forfar DD8 3WA Telephone 01307 473331



**MEMORANDUM  
COMMUNITIES DEPARTMENT  
Environmental & Consumer Protection**

TO: ED TAYLOR, DEVELOPMENT CONTROL OFFICER

FROM: STEVEN THOMSON, SENIOR ENVIRONMENTAL HEALTH OFFICER

OUR REF: ST/MF

YOUR REF: 14/01067/FULL

DATE: 17 APRIL 2015

SUBJECT: **PROPOSED WIND TURBINE BAIRDS MALT ARBROATH, ANGUS**

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I refer to the above application passed to me for comment and I advise as follows:

The aspects of this application which are of interest to this service are operational turbine noise and shadow flicker.

Operational turbine noise

This is dealt with in section 8 of the applicants Environmental Report (ER) dated December 2014. It explains the methodology used to derive the noise criteria and the method used to predict operational turbine noise. The assessment concludes that the proposed development will comply with the derived noise limits.

Angus Council appointed Mr Dick Bowdler, Acoustic Consultant to review the applicant's methodology and a copy of his report is attached for your information. This service has taken Mr Bowdler's report into consideration and is of the opinion that the following matters require to be clarified in order to aid the determination of this application;

1. The applicant is requested to provide the following additional information:
  - a) Calibration certificates for the sound level meters.
  - b) On site calibration and calibration drift records.
  - c) Manufacturers sound power levels as used in the calculations.
  
2. The existing maltings site generates relatively high levels of noise when compared to the normal rural location for a wind turbine. As background noise levels are used to derive appropriate criteria for the assessment of wind

turbine noise in line with ETSU-R-97; The assessment and rating of noise from wind farms (ETSU-R-97) it is important to ensure that the data used is typical. The applicant's consultant has taken reasonable steps to ensure this is the case. They have not however done an assessment to ensure that the existing operations are complying with the extant noise limits applicable to the maltings site to ensure that existing operations are within limits. It is requested that the applicant carry out an appropriate assessment of this aspect.

3. No assessment has been made for properties to the south despite some of these being within the original 35dBA contour. An appropriate assessment is requested for these properties.
4. It appears that the background noise data may have been filtered for wind direction but this is not clear. If the data has been filtered in this way potentially this will exclude quiet periods depending on wind directions that have been removed. It is requested that the applicant clarify this point giving full justification for any filtering.
5. The applicant has suggested that a daytime lower limit of 38db is used however no justification is given for this. A daytime lower limit of 36db is considered to be more appropriate taking into account the factors suggested in ETSU-R-97 especially the number of properties potentially affected and the effect on power generation. A reassessment based on a daytime lower limit of 36db is requested.
6. There is no assessment of the impact of the noise on the amenity of residents as required by policy ER35 of the Angus Local Plan Review. The comment on page 100 that there is a low likelihood of audibility is not robustly demonstrated. Factors such as amplitude modulation (swish) which will not start to fall off, either upwind or downwind of the turbine, until about 300m and the background noise tonal content will be influential in this. An assessment of the impact on residential amenity is requested.
7. The land west of the proposed turbine has been granted planning permission for the formation of a new business park (11/00428/FULM). No assessment of the impact of turbine noise on potential business use has been reported in the ER and the applicant is requested to carry this out including taking into account amplitude modulation (swish) and any possible mitigation.

This service objects to this application due to the lack of information relating to operational wind turbine noise as detailed above. We will review this objection if these issues are adequately addressed by the applicant.

#### Shadow Flicker

This is covered in section 12 and Appendix 5 of the ER. The assessment, based on meteorological factors, suggests that shadow flicker should not be significant and mitigation is not proposed unless problems become apparent.

The following matters require to be clarified in order to aid the determination of this application;

1. The criterion used in the assessment, namely 30 hrs per year, is not robust as it ignores potentially short term significant events. A 30 minute per day limit is also advocated by guidance from Northern Ireland, Germany and PREDAC as referenced in the DECC report; update of UK shadow flicker evidence base. The same report also suggests that assessments against these limits should be based on astronomic factors and not meteorological factors. It is requested that Shadow flicker is reassessed against astronomic worst case criteria of 30 hours per year and 30 minutes per day.
2. The accuracy of Figure 12.2 Appendix 5 should be checked as receptor 2R is shown outside the theoretical zone yet table 12.3 quotes a calculated impact of 32.7 hours. Figure 12.2 should also be updated with a 30 minute per day contour to reflect the additional criteria.
3. The applicant states that a watching brief will be under taken for the first year of operation. However this is again not considered to be robust enough as impacts are weather dependant. The applicant is requested to propose a detailed Shadow flicker management scheme including a complaint investigation procedure.

This service objects to this application due to the lack of information relating to shadow flicker as detailed above. We will review this objection if these issues are adequately addressed by the applicant.

I hope the above is of assistance to you and if you have any queries please do not hesitate to contact me.

**AC6**  
Dick Bowdler  
Acoustic Consultant

01383 882 644  
077 8535 2534  
dick@dickbowdler.co.uk

## **BAIRDS MALT WIND TURBINE**

**Review of the Noise Section of the Environmental Report**

**6<sup>th</sup> March 2015**

## **BAIRDS MALT WIND TURBINE**

### **Review of the Noise Section of the Environmental Report**

#### **1 SUMMARY**

- 1.1 Background noise measurements were carried out at four locations but none of these are to the south of the turbine and no assessment has been made of properties to the South. This omission needs to be rectified.
- 1.2 The noise measurement equipment used appears to conform to good practice.
- 1.3 If the background noise relates only to downwind conditions this may not give a true picture of the situation because turbine noise will be the same upwind as downwind at the nearest properties.
- 1.4 I agree that the turbine noise levels set out in Table 8.27 are correct in terms of good practice.
- 1.5 The applicant has proposed an ETSU-R-97 lower limit of 38dB during the day and at night. My opinion is that the noise limits day and night should be 36dB or background noise plus 5dB where background noise is taken over night and quiet day together.
- 1.6 Various points in the assessment need to be clarified but it seems likely that the application will comply with ETSU-R-97.
- 1.7 There is no assessment of the impact of operational noise from the development on the amenity of residents.
- 1.8 The noise from the turbine might limit the use of the adjacent site for offices with openable windows.
- 1.9 Any noise condition should be set to avoid creeping increases in noise.
- 1.10 In the interests of clarity and rigor the following should be provided in the assessment:
  - Calibration certificates for the sound level meters,
  - On site calibration and calibration drift records.
  - Confirm that the background noise level graphs relate only to downwind conditions.
  - Turbine sound power levels used in the calculations.

## **2 INTRODUCTION AND GENERAL**

- 2.1 This report is prepared for Angus Council to provide a review of the noise section of the application for the proposed turbine at Bairds Malt, Arbroath. The candidate turbine for noise purposes is the Enercon E44 on a 55m hub at Grid Reference 361828, 740071.
- 2.2 I have examined the noise section (chapter 8) of the applicant's Environmental Report (ER) and Appendix 3 of the application together with various other documents in the application. I have seen the raw data from the background noise measurements. I have also visited areas surrounding the site.
- 2.3 The main documents to which I refer are ETSU-R-97 – *The Assessment and Rating of Noise from Wind Farms* and the Institute of Acoustics *Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IOAGPG). The Appendix to this report provides a summary of planning guidance appropriate in Scotland.

## **3 BACKGROUND NOISE IN THE NOISE ASSESSMENT**

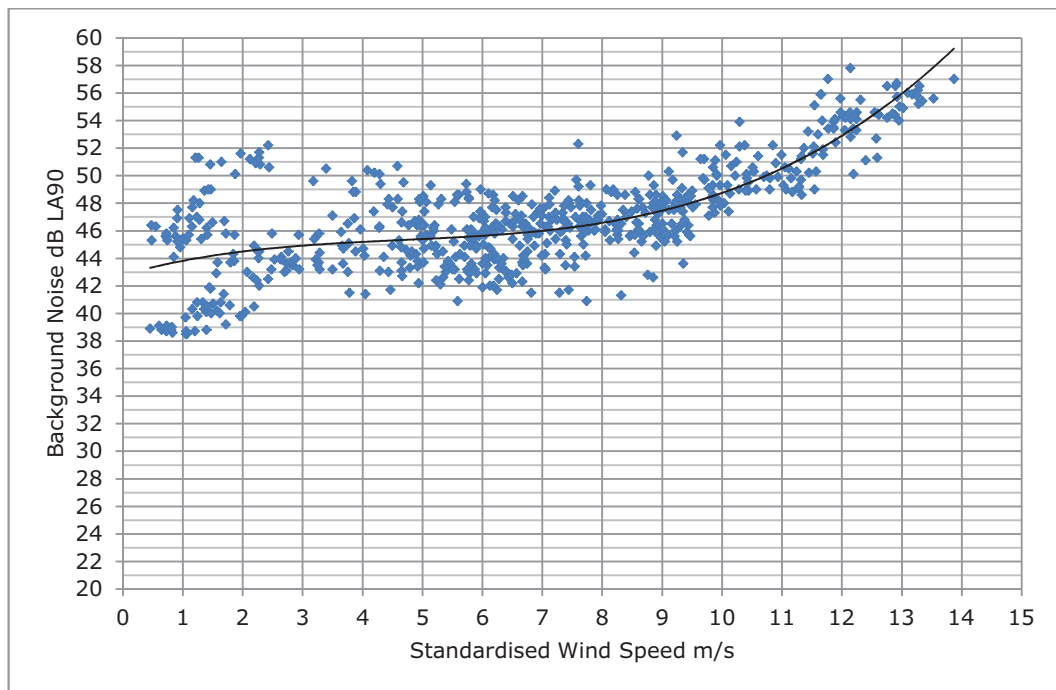
- 3.1 Whatever assessment methods are used it is important to establish a clear baseline of the existing noise conditions. This is done by measuring background noise levels at representative locations and plotting them against wind speed measured on the development site.
- 3.2 Background noise measurements were carried out at four locations from 18<sup>th</sup> January to 20<sup>th</sup> February 2014. I am satisfied that the monitoring locations were representative of the surrounding properties in each case. However I note that no background noise measurements have been taken and no assessment has been made for properties to the south of the turbine. I will return to this later. The noise measurement equipment used appears to conform to good practice – however, there are no calibration certificates for the sound level meters nor is on site calibration or calibration drift recorded.
- 3.3 As the applicant admits, the background noise levels here are unusual for a wind turbine site in that they are dominated by noise from the industrial estate (mostly Bairds itself) rather than by wind. Investigation has been carried out by the applicant to ascertain the times of running of the main noise sources and this is provided in Appendix 3 of the application.
- 3.4 I have done various analyses of the data, particularly at H1 and H2. I cannot find anything in the data that relates specifically to any of the noise sources shown in Appendix 3. There are certainly significant variations of background noise unrelated to wind speed. Looking at the description of the noise sources in Appendix 3 there does not appear to be anything operating during the background noise monitoring period that would not be operating at other times of the year. In addition there is some "safety margin" since the applicant has excluded many data points, almost all at the higher noise levels.



Subject to my comments below I can see no reason why the un-excluded background noise levels shown on the graphs are not representative of the general conditions.

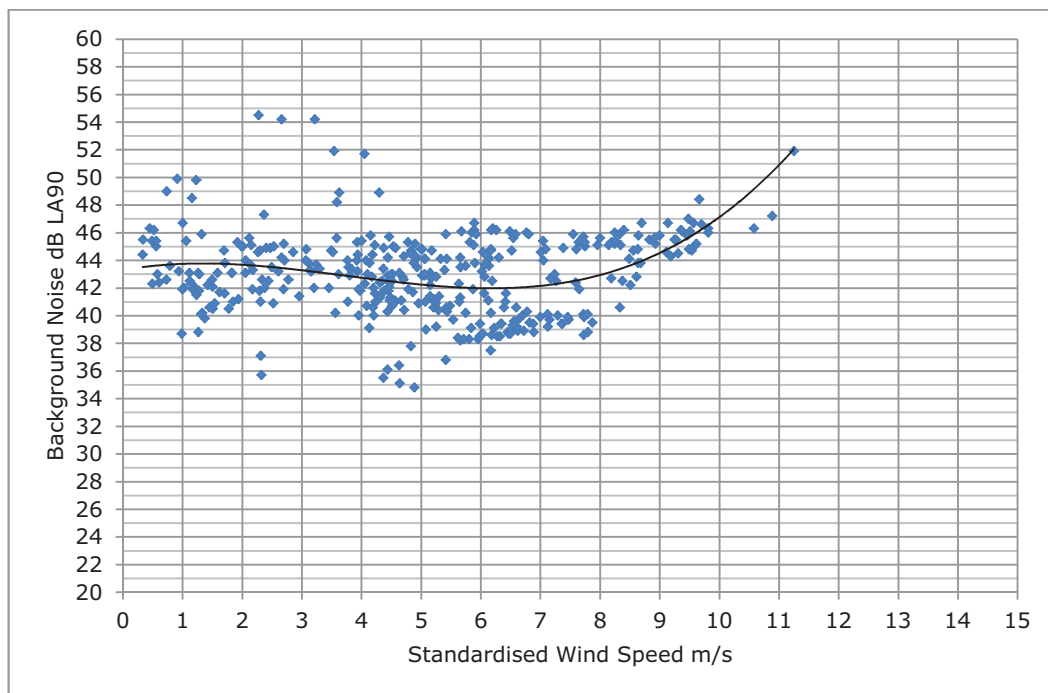
- 3.5 I have not tried to reproduce the background noise curves from the raw data generally. However I have analysed the data in various ways to see if there are any anomalies or obvious problems. It appears, as set out in section 8.3 of the ER, that all the noise graphs used in this assessment contain data only when the monitoring property is downwind of the turbine. However, I don't find it entirely clear that this is the case so it would be helpful if this were confirmed.
- 3.6 At H1 the lowest noise level on Fig 8.13 at night is 41dB and during the quiet day is 42dB. However, there are night time readings below 40dB. Inspection shows that these are mostly when H1 is not downwind. So I have carried out an analysis of upwind and downwind background noise.

Fig 1



- 3.7 Fig 1 above is plotted using the night time data at H1. I have excluded data if either noise or wind speed is missing and data during rain. I have also only used data where H1 is downwind. We can see that this contains broadly the same data as Fig 8.13 because many of the same points can be found – for example those at x/y values 13.9/57, 12.1/58, 11.8/57 and 7.5/52. However, Fig 8.13 seems to exclude data below about 1.5m/s. The trendline does not exclude manually excluded data as in Fig 8.13 because I do not know the criteria used. Fig 2 below shows the data when H1 is upwind of Bairds.

Fig 2



- 3.8 As can be seen, in Fig 1 the trendline at 6 and 8m/s is about 45 and 47dB but in the bottom graph it is 42 and 43dB. This is hardly surprising as noise from Bairds will be less when H1 is upwind as opposed to downwind of Bairds. However, when the noise source is high up, as with the turbine, sound carries further upwind as well as downwind. 4.4.3 of IOAGPG sets out to quantify this. For a 77m high turbine such as this the reduction of noise upwind does not start until about 400m away so turbine noise at H1, which is about 300m away, will be more or less the same downwind and upwind.
- 3.9 The nearest property to the North at Hospitalfield is about 350m and the nearest caravan to the South is just over 400m from the turbine. IOAGPG also says for a 77m high turbine even by 600m the attenuation upwind is only just over 2dB. So turbine noise at many properties will be as audible upwind as it will downwind.
- 3.10 I have not checked day time levels in detail nor have I looked at other locations in the same detail as H1. I suggest the applicant is asked to look at the points I have made here with respect to H1 and to incorporate them generally into the assessment where they are applicable.
- 3.11 Background noise measurements have not been made at properties to the south of the site. There are a number of properties on the 35dB contour around Elliot including those on Lochside and those close to the A92 opposite the footbridge over the railway. In particular the caravan park, which is well inside the 35dB contour, needs to be assessed. Intuitively background noise might be expected to be fairly high because of the presence of the road, the sea and the industrial estate. However, that is not really sufficient for a proper assessment. The main unknown in this area is not so much the noise level related to wind speed, which is the usual requirement for turbines, but

the underlying background noise level without the influence of wind. The measurements made for Corse Hill wind farm close to the A92 about a mile to the west were as low as 30dB at night. I suggest that the assessment on the south side could be done by a series of spot measurements on a day with wind speeds less than about 3 to 5m/s at 10m height. There would need to be measurements at various key times in the day and night or alternatively a 24 hour survey if a long enough period with low wind speeds could be found. I do not think it would necessarily be required to carry out wind speed measurements provided it was clear that wind noise was not a relevant factor in the measurements. If the maximum turbine noise is less than the underlying background noise plus 5dB then the measurement of noise due to wind (and so the measurement of wind speed) would not be required. I suggest that the applicant is asked to provide a method statement for carrying this out for approval by the Council prior to any measurements taking place. The alternative would be a full scale noise and wind speed survey.

#### **4 TURBINE NOISE IN THE NOISE ASSESSMENT**

- 4.1 The calculation of noise levels of the turbine at surrounding properties has two stages. In the first place the sound power level of the turbine needs to be established. In the second the attenuation of noise along the propagation path from the turbine to the houses has to be calculated. As part of this the location of noise sensitive properties has to be accurately identified.
- 4.2 Good practice in calculating turbine noise levels also includes an allowance for topography. 2dB more attenuation if a turbine is totally obscured at a property and 3dB less attenuation where there is a significant valley between the turbine and property. This is set out in the IOAGPG.
- 4.3 The location for H1 has been taken close to the background noise measurement location. However, the nearest amenity space close to the cottages is a little nearer to the turbine than, that to the north-east of the cottages. This only results in an increase of 0.3dB.
- 4.4 The other locations set out in Table 8.27 show locations where the maximum and minimum turbine noise levels occur for each group of houses represented by a background noise survey. I agree that these are representative locations.
- 4.5 Although the turbine sound power levels have been discussed in some detail in 8.4 of the noise chapter it does not state anywhere what are the final figures used. That would have been helpful. However, I agree that the turbine noise levels set out in Table 8.27 are correct in terms of good practice within a fraction of a decibel.

#### **5 ETSU-R-97 ASSESSMENT**

- 5.1 The ETSU-R-97 noise limits are structured as 5dB above background noise level or a lower fixed limit, whichever is the greater. During the day the lower

limit is within the range 35 to 40dB depending on the results of three tests. These are set out as follows in ETSU-R-97:

*In low noise environments the day-time level of the LA90,10min of the wind farm noise should be limited to an absolute level within the range of 35-40dB(A). The actual value chosen within this range should depend upon a number of factors:*

- *the number of dwellings in the neighbourhood of the wind farm*
- *the effect of noise limits on the number of kWh generated*
- *the duration and level of exposure.*

- 5.2 The applicant has proposed a lower limit of 38dB on the grounds that there is already industrial noise. It seems to me that such justification is not sufficient as no account has been taken of all the tests. My opinion is that there are many properties within the 35dB contour which suggests a strong downward pressure on the limit. The effect on power generated seems to be small and possibly nil which also is a strong downward pressure. The majority of houses are downwind in the prevailing wind but the background noise levels are fairly high. This suggests no change in the limit. So if we start at the mid-point between 35 and 40dB – 37.5dB two downward movements and one neutral suggest that the level should be 36dB at most.
- 5.3 As set out on page 63 of ETSU-R-97 and described further in IOAGPG 2.8.1, where there is only a small difference between the day and night time background noise levels a common set of assessment limits can be applied for all time periods. The difference here in the critical wind speed range is about 2dB and I suggest that such assessment limits could be adopted here. That is to say the noise limits day and night should be 36dB or background noise plus 5dB where background noise is taken over night and quiet day together.
- 5.4 From the information supplied in the ER it appears that the turbine noise levels will hardly ever exceed the background noise in any ten minute period. This would need to be reviewed following clarification of the various points I have raised above but it seems likely that the application will comply with ETSU-R-97. But the assessment needs to be more robust.

## **6 SIGNIFICANCE OF IMPACT**

- 6.1 Angus Local Plan Review Policy ER35 says that wind energy developments should demonstrate that *there is no unacceptable detrimental effect on residential amenity, existing land uses . . . by reason of . . . noise . . .* As I also point out in the appendix it is necessary carry out an assessment of the impact of the noise on people to assist the decision maker.
- 6.2 There is no assessment of the impact of operational noise from the development on the amenity of residents. My appendix sets out a methodology to do this, but others can be used. In addition, however, there

are various factors here that mean that a simple comparison of the overall turbine noise with the prevailing background noise might not be adequate.

- The swishing sound created by the directivity of the noise from the turbine normally falls off upwind and downwind of the turbine but not until about 300m. Turbine noise might be more noticeable than normal at the nearest properties for this reason.
- Observations on site suggest that much of the background noise is mid and high frequency. This may not mask turbine noise effectively.

6.3 In respect of these two points the comment at the bottom of page 100 that there is a low likelihood of audibility does not seem to have been robustly demonstrated though I agree that, subject to the various clarifications I have requested, the overall turbine noise will usually be no higher than background noise.

## **7 OFFICES**

7.1 The land immediately adjacent to the turbine site is designated for commercial use. The applicant states that the predicted noise level of the turbine at a position 50m away is 57dB At 100m distant the turbine will have a level of 50 to 55dB (LAeq). This would result in internal levels in offices of NR35 to 40 with a noticeable swish character. This might limit the use of the site for offices with openable windows because of the character of the noise rather than the level. This might make the closest of the adjacent site marginally less attractive to some users but I do not think, bearing in mind there is already noise of a similar level from Bairds at times, the impact would be significant.

## **8 CONDITIONS**

8.1 If the application is allowed there should be a noise condition. If this is set at normal ETSU-R-97 limits it could allow creeping increases in noise from a site that already generates noise. I suggest therefore that the noise limits are set at the applicant's calculated noise levels plus a margin of 1dB.

## APPENDIX - METHODOLOGY OF ASSESSMENT

The planning system has to achieve a balance in the public interest between the case made for a development and the predicted impact(s) on neighbours and the general environment. In order to do this, it is essential that the impact is clearly and accurately set out in a way that will allow the decision maker to make an informed decision.

The requirement to describe the impact of a development is set out in EU Environmental Assessment Directive 99/337/EEC and incorporated into Scottish Law by means of the *Environmental Impact Assessment (Scotland) Regulations 2011*. Scottish Planning Circular 3/2011 provides guidance. Article 3 of the directive says *The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on . . . human beings. Annexe IV requires that an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed project is made. It also requires A description of the likely significant effects of the proposed project on the environment resulting from . . . . - the emission of pollutants.*

Scottish Government online renewables planning advice, "Onshore Wind Turbines" says 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97) published by the former Department of Trade and Industry [DTI] should be followed. Other guidance in this document is PAN 1-2011, Planning and Noise, which is the current Scottish advice on noise. This says *Good acoustical design and siting of turbines is essential to minimise the potential to generate noise. It also says that Information and advice on noise impact assessment methods is provided in the associated Technical Advice Note Assessment of Noise.* This Technical Advice Note describes how to carry out a noise impact assessment for any potentially noisy development as part of an environmental impact assessment or on its own.

### ETSU-R-97

The government's preferred method of assessment for wind farms is ETSU-R-97 – *The Assessment and Rating of Noise from Wind Farms*. In paragraph 1 of the Executive Summary the purpose of the document is made clear: *This document describes a framework for the measurement of wind farm noise and gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities. The suggested noise limits and their reasonableness have been evaluated with regard to regulating the development of wind energy in the public interest.* In other words ETSU-R-97 is already a methodology that rates the planning balance between the loss of amenity of individual neighbours and the perceived desirability of renewable energy in the wider public interest.



ETSU-R-97 compares the turbine noise with a level 5dB above background noise but, when background noise levels are low, it sets a lower limit. The day time lower limit can be anywhere between 35 and 40dB and the night time lower limit is 43dB. ETSU-R-97 provides for higher levels of turbine noise to be permitted at houses where the occupier has a financial involvement in the wind farm.

### **Assessment of Impact**

ETSU-R-97 does not provide a measure of loss of amenity. It does not necessarily fulfil the requirement of a description of the likely significant effects in the EIA Regulations. For example at night the lower ETSU-R-97 limit is 43dB. At a wind speed of around 6m/s when turbines may well have reached more or less their maximum noise output they could be producing this limit of 43dB at the nearest property. At one hypothetical site, perhaps near a main road system, the background noise level could be 38dB and so the margin of turbine noise over background noise is 5dB. At another hypothetical site the background noise might be 23dB and the margin of turbine noise over background noise 20dB. Clearly the significance of the impact is far more in the second case than in the first. In such circumstances ETSU-R-97 may be the starting point but not the whole answer. Whilst it is correct that many decisions by reporters and inspectors, and by Councils, are quite properly based on ETSU-R-97, where assessments have special factors that need to be taken into account reporters and inspectors have done so.

In 3.20 of the Scottish web-based Technical Advice Note it says *In deciding if a significant impact occurs in regard to the assessment of industrial noise, or noise of an industrial nature, using the methodology of BS 4142 (where appropriate); the Scottish Government consider impacts are normally not significant (in a quantitative sense only) the difference between the Rating and background noise levels is less than 5 dB(A), and that usually the threshold of minor significant impacts is when the difference between the Rating and background noise levels is at least 5 dB(A); and commonly do not become sufficiently significant to warrant mitigation until the difference between the Rating and background noise levels is more than 10 dB(A).*

BS4142:2014 sets out a rating method for industrial noise. It says:

- *b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

BS4142 is not generally used for wind farm noise. However, it is well known that wind farm noise is more annoying than all other noise except railway sidings decibel for decibel. A BS4142 assessment is therefore likely to underestimate the impact of turbine noise.

It should be noted that, because turbine noise is measured by a parameter different from normal – L90 - these margins must be reduced by 2dB. So where turbine noise exceeds background noise by more

than 8dB the level is, in the view of the Scottish Government, sufficiently significant to warrant mitigation and in the view of BS4142 an indicator of significant adverse impact.

ETSU-R-97 itself, on page 60, considers that a margin of 5dB above background noise *places the margin at the upper end of the range which can be considered to be of marginal significance.*

Taking all these points together the following table can be constructed to describe the significance in terms of the EIA Directive.

- A difference of 1dB or less – insignificant
- A difference of 2 to 4dB – marginal loss of amenity
- A difference of 5 to 7dB – significant loss of amenity
- A difference of 8dB or more – major loss of amenity

ETSU-R-97 provides best practice for many procedures in assessment of wind farm noise. In particular it is detailed in its description of the measurement and processing of background noise levels. However, it does not make any recommendations with regard to the calculation of turbine noise.

In May 2013 the Institute of Acoustics published a *Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IOAGPG). This sets out procedures for calculating turbine noise (which are absent from ETSU-R-97) and for dealing with wind shear and other matters. The IOAGPG is endorsed by the Scottish Government and is accompanied by six "Supplementary Guidance Notes".

**By E-mail**

Planning & Transport Division  
Angus Council  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
plnprocessing@angus.gov.uk

Longmore House  
Salisbury Place  
Edinburgh  
EH9 1SH

Direct Line: 0131 668 8076  
Switchboard: 0131 668 8600  
Ian.Thomson2@scotland.gsi.gov.uk

Our ref: HGG/ATA/651  
Our Case ID: 201406255  
Your ref: 14/01067/FULL

22 January 2015

Dear Sirs

**Town And Country Planning (Development Management Procedure) (Scotland) Regulations 2013**  
**Bairds Malt Ltd, Elliot Industrial Estate, Arbroath**

Thank you for your consultation which we received on 09 January.

We have considered your consultation for the erection of a single wind turbine of 55 metres to hub height, 77 metres to blade tip, and ancillary development at Elliot Industrial Estate, Arbroath and we comment as follows:

A turbine at this location and of this height will have an impact on the setting of the A-listed Hospitalfield House. Visualisations produced by the agent demonstrate the turbine will be visible in certain views from the house and its grounds. The main elevations and rooms of Hospitalfield look to the west and south where the turbine is proposed. We recognise that existing industrial features, including a telecommunications mast, are part of the established setting of Hospitalfield. The impact of any turbine in this location is therefore likely to be moderate. We agree with the general conclusion of the Environmental Report in relation to Hospitalfield and don't consider that this application raises issues of national significance that warrant an objection.

Notwithstanding our comments above, we confirm that your Council should proceed to determine the application without further reference to us.

If you require any further information, I can be contacted on 0131 668 8076.

Yours faithfully

**Ian Thomson**

Senior Heritage Management Officer, Historic Buildings East

## CaneyV

---

**From:** ALLEN, Sarah J [Sarah.ALLEN@nats.co.uk] on behalf of NATS Safeguarding [NATSSafeguarding@nats.co.uk]  
**Sent:** 15 January 2015 08:30  
**To:** PLNProcessing  
**Subject:** Your Ref: 14/01067/FULL (Our Ref: SG20508)

The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.

However, please be aware that this response applies specifically to the above consultation and only reflects the position of NATS (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.

If any changes are proposed to the information supplied to NATS in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.

Yours faithfully,

Sarah Allen  
Technical Administrator  
On behalf of NERL Safeguarding Office

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If you are not the intended recipient, please notify our Help Desk at Email [Information.Solutions@nats.co.uk](mailto:Information.Solutions@nats.co.uk) immediately. You should not copy or use this email or attachment (s) for any purpose nor disclose their contents to any other person.

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---

**CaneyV**

**From:** Spectrum Licensing [Spectrum.Licensing@ofcom.org.uk]  
**Sent:** 16 January 2015 01:14  
**To:** CaneyV  
**Cc:** windfarms@atkinsglobal.com; windfarms@jrc.co.uk  
**Subject:** RE: Consultation for Maltings Peasiehill Road Elliot Industrial Estate Arbroath  
**Attachments:** ufm39.rtf

**FIXED LINK REPORT FOR WINDFARM CO-ORDINATION AREA:**

Dear Sir/Madam

***Search Radius 0m at Centre NGR N***

<b><i>Links</i></b>	<b><i>Company</i></b>
0929176/1	Joint Radio Company Ltd
0928068/1	Vodafone Limited

These details are provided to Ofcom by Fixed Link operators at the time of their licence application and cannot be verified by Ofcom for accuracy or currency and Ofcom makes no guarantees for the currency or accuracy of information or that they are error free. As such, Ofcom cannot accept liability for any inaccuracies or omissions in the data provided, or its currency however so arising. The information is provided without any representation or endorsement made and without warranty of any kind, whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, non-infringement, compatibility, security and accuracy.

Our response to your co-ordination request is only in respect of microwave fixed links managed and assigned by Ofcom within the bands and frequency ranges specified in the table below. The analysis identifies all fixed links with either one link leg in the coordination range or those which intercept with the coordination range. The coordination range is a circle centred on your provided national grid reference. We add an additional 500 metres to the coordination range that you request. Therefore if you have specified 500 metres the coordination range will be 1km.

If you should need further information regarding link deployments and their operation then you will need to contact the fixed link operator(s) identified in the table above directly.

Additional coordination is also necessary with the band managers for the water, electricity and utilities industries which operate in the frequency ranges 457-458 MHz paired with 463-464 MHz band. You should contact both the following:

- Atkins Ltd at [windfarms@atkinsglobal.com](mailto:windfarms@atkinsglobal.com).
- Joint Radio Company (JRC) at [windfarms@jrc.co.uk](mailto:windfarms@jrc.co.uk). Additionally, you can call the JRC Wind Farm Team on 020 7706 5197.

For self coordinated links operating in the 64-66GHz, 71-76GHz and 81-86GHz bands a list of current links can be found at: <http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/>

Regarding assessment with respect to TV reception, the BBC has an online tool available on their website: [http://www.bbc.co.uk/reception/info/windfarm\\_tool.shtml](http://www.bbc.co.uk/reception/info/windfarm_tool.shtml). Ofcom do not forward enquiries to the BBC.

Please note other organisations may require coordination with regard to your request. More information regarding windfarm planning is available on the British Wind Energy Association website [www.bwea.com](http://www.bwea.com).

**Table of assessed fixed links bands and frequency ranges**

Band (GHz)	Frequency Range (MHz)
1.4/1.5	1350 -1375 1450 -1452 1492 -1530
1.6	1672 – 1690
1.7	1764 – 1900
2	1900 – 2690
4	3600 – 4200
6	5925 – 7110
7.5	7425 – 7900
11	10700 – 11700
13	12750 – 13250
14	14250 – 14620
15	14650 – 15350
18	17300 – 19700
22	22000 – 23600
25	24500 – 26500
28	27500 – 29500
38	37000 – 39500
50	49200 – 50200
55	55780 – 57000

Regards

---

**From:** CaneyV [mailto:CaneyV@angus.gov.uk]

**Sent:** 09 January 2015 13:08

**To:** NATSsafeguarding@nats.co.uk; Spectrum Licensing; windfarms@jrc.co.uk; esro@rspb.org.uk; windfarms@caa.co.uk; Safeguarding@hial.co.uk; RobertsS; ClarkPR

**Subject:** Consultation for Maltings Peasihill Road Elliot Industrial Estate Arbroath

Regards,  
Veronica.

Veronica Caney  
Clerical Officer (Development Control)  
Angus Council  
Planning Department  
County Buildings,  
Market Street,  
Forfar.  
DD8 3LG  
Tel : 01307 473242

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**MooreDJ**

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**From:** Windfarms Team [windfarms.team@jrc.co.uk]  
**Sent:** 09 January 2015 16:34  
**To:** PLNProcessing  
**Subject:** Planning Ref: 14/01067/FULL - Maltings, Elliot Industrial Estate, Arbroath - Proposed Wind Turbine

IMPORTANT NOTICE: This e-mail is strictly confidential and is intended for the use of the addressee only. The contents shall NOT be disclosed to any third party without permission of the JRC.

Dear Sir/Madam,

Planning Ref: 14/01067/FULL

Name/Location: Maltings

Turbine at NGR/IGR: 361828 740071

Hub Height: 55m Rotor Radius: 22m

(defaults used if not specified on application)

Cleared with respect to radio link infrastructure operated by:-

Local Electricity Utility and Scotia Gas Networks

JRC analyses proposals for wind farms etc. on behalf of the UK Fuel & Power Industry and the Water Industry in north-west England. This is to assess their potential to interfere with radio systems operated by utility companies in support of their regulatory operational requirements.

In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided. However, if any details of the wind farm change, particularly the disposition or scale of any turbine(s), it will be necessary to re-evaluate the proposal.

In making this judgement, JRC has used its best endeavours with the available data, although we recognise that there may be effects which are as yet unknown or inadequately predicted. JRC cannot therefore be held liable if subsequently problems arise that we have not predicted.

It should be noted that this clearance pertains only to the date of its issue. As the use of the spectrum is dynamic, the use of the band is changing on an ongoing basis and consequently, developers are advised to seek re-coordination prior to considering any design changes.

Regards

Keith Brogden

Wind Farm Team

The Joint Radio Company Limited  
Dean Bradley House,  
52 Horseferry Road,  
LONDON SW1P 2AF  
United Kingdom

DDI: +44 20 7706 5197

TEL: +44 20 7706 5199

Skype: keithb\_jrc

<windfarms@jrc.co.uk>

**NOTICE:**

This e-mail is strictly confidential and is intended for the use of the addressee only. The contents shall not be disclosed to any third party without permission of the JRC.

JRC Ltd. is a Joint Venture between the Energy Networks Association (on behalf of the UK Energy Industries) and National Grid.

Registered in England & Wales: 2990041

<<http://www.jrc.co.uk/about>>

## CaneyV

---

**From:** Weston, Jenny [Jenny.Weston@rspb.org.uk]  
**Sent:** 02 February 2015 16:51  
**To:** PLNProcessing  
**Subject:** FW: Consultation for Maltings Peasiehill Road Elliot Industrial Estate Arbroath  
**Attachments:** ufm39.rtf

FAO David Gray

Thankyou for consulting RSPB Scotland on the application below. RSPB does have some knowledge of the ornithological interest of this area. We do not feel that significantly negative impacts on birds are likely to occur if this proposal is consented. However, there are several proposals for similar sized turbines in this general area, in addition to the already operational turbines in the wider landscape. Post construction monitoring linked to some form of cumulative impact assessment would assist our understanding of potential issues connected to the build up of turbines on birds.

Regards

**Jenny Weston**

**Conservation Officer**

RSPB Scotland

RSPB Scotland is part of the RSPB which speaks out for birds and wildlife, tackling the problems that threaten our environment. Nature is amazing - help us keep it that way.

The Royal Society for the Protection of Birds (RSPB) is a registered charity: England and Wales no. 207076, Scotland no. SC037654.

---

**From:** CaneyV [<mailto:CaneyV@angus.gov.uk>]  
**Sent:** 09 January 2015 13:08  
**To:** [NATSSafeguarding@nats.co.uk](mailto:NATSSafeguarding@nats.co.uk); Spectrum Licensing; [windfarms@jrc.co.uk](mailto:windfarms@jrc.co.uk); ESRO; [windfarms@caa.co.uk](mailto:windfarms@caa.co.uk); [Safeguarding@hial.co.uk](mailto:Safeguarding@hial.co.uk); RobertsS; ClarkPR  
**Subject:** Consultation for Maltings Peasiehill Road Elliot Industrial Estate Arbroath

Regards,  
Veronica.

Veronica Caney  
Clerical Officer (Development Control)  
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DD8 3LG  
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04/02/2015

**CaneyV**

**From:** Windfarms [Windfarms.Windfarms@caa.co.uk]  
**Sent:** 12 January 2015 10:01  
**To:** CaneyV  
**Subject:** RE: Consultation for Maltings Peasiehill Road Elliot Industrial Estate Arbroath

Dear Sir/Madam

**Request for Comment under the Town and Country Planning Act 1990 and the Town and Country Planning (Scotland) Act 1997**

There is currently a high demand for CAA comment on wind turbine applications which exceeds the capacity of the available resource to respond to requests within the timescales required by Local Planning Authorities. The CAA has no responsibilities for safeguarding sites other than its own property, and a consultation by a Council is taken as a request for clarification of procedural matters. Councils are reminded of their obligations to consult in accordance with ODPM/DfT Circular 1/2003 or Scottish Government Circular 2/2003, and in particular to consult with NATS and the Ministry of Defence as well as any aerodromes listed in Annex 3 of the above documents, taking note of appropriate guidance and policy documentation. Should the Council be minded to grant consent to an application despite an objection from one of the bodies listed in the circular, then the requisite notifications should be made.

Whilst the CAA recommends all aerodrome operators/license holders develop associated safeguarding maps and lodge such maps with local planning authorities, the CAA additionally encourages councils/planning authorities to undertake relevant consultation with known local aerodromes regardless of status or the existence of any aerodrome/council safeguarding agreement, including local emergency service Air Support Units (e.g. Police Helicopter or Air Ambulance). Such units may operate in the area of concern and could be affected by the introduction of tall obstacles. For example Police helicopters are permitted to operate down to 75 feet and will routinely follow main roads and motorways during their operations. Both the Police and Air Ambulance may need to land anywhere but will also have specifically designated landing sites.

There is an international civil aviation requirement for all structures of 300 feet (91.4 metres)\* or more to be charted on aeronautical charts. However, on behalf of other non-regulatory aviation stakeholders, in the interest of Aviation Safety, the CAA requests that any feature/structure 70 feet in height, or greater, above ground level is notified to the Defence Geographic Centre ([mail to dvof@mod.uk](mailto:dvof@mod.uk)), including the location(s), height(s)\* and lighting status of the feature/structure, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, at least 6 weeks prior to the start of construction, to allow for the appropriate notification to the relevant aviation communities.

Any structure of 150 metres\* or more must be lit in accordance with the Air Navigation Order and should be appropriately marked. Although if an aviation stakeholder (including the MOD) made a request for lighting it is highly likely that the CAA would support such a request, particularly if the request falls under Section 47 of the Aviation Act.


Cumulative effects of turbines may lead to unacceptable impacts in certain geographic areas.

The Ministry of Defence will advise on all matters affecting military aviation.

Should the Council still have a specific query about a particular aspect of this application the CAA will help in the clarification of aviation matters and regulatory requirements. Site operators remain responsible for providing expert testimony as to any impact on their operations and the lack of a statement of objection or support from the CAA should not be taken to mean that there are no aviation issues, or that a comment from an operator lacks weight.

The CAA Policy and Guidance on Wind Turbines is contained in the CAP 764, which can be obtained from the CAA Website at the following address: [CAP 764 Version 5](#). In addition, the CAA, through the Airspace and Safety Initiative Windfarm Working Group, have published the following [Guidance for Planning Authorities](#).

Yours Faithfully

  
Mark Deakin

12/01/2015



Squadron Leader (RAF)  
Surveillance and Spectrum Management  
Safety and Airspace Regulation Group  
Civil Aviation Authority  
45-59 Kingsway London WC2B 6TE  
Tel: 020 7453 6534 Fax: 020 7453 6565  
[mark.deakin@caa.co.uk](mailto:mark.deakin@caa.co.uk)

\*The effective height of a wind turbine is the maximum height to blade tip.

---

**From:** CaneyV [mailto:CaneyV@angus.gov.uk]  
**Sent:** 09 January 2015 13:08  
**To:** NATSsafeguarding@nats.co.uk; Spectrum Licensing; windfarms@jrc.co.uk; esro@rspb.org.uk;  
Windfarms; Safeguarding@hial.co.uk; RobertsS; ClarkPR  
**Subject:** Consultation for Maltings Peasiehill Road Elliot Industrial Estate Arbroath

Regards,  
Veronica.

Veronica Caney  
Clerical Officer (Development Control)  
Angus Council  
Planning Department  
County Buildings,  
Market Street,  
Forfar.  
DD8 3LG  
Tel : 01307 473242

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\*\*\*\*\*

**APPLICATION FOR PLANNING PERMISSION (REFERENCE: 14/01067/FULL)**

**Erection of a wind turbine 55M to hub height and 77M to blade tip  
and ancillary development  
Bairds Malt, Peasiehill Road, Elliot Industrial Estate, Arbroath DD11 2NJ**

**ECONOMIC DEVELOPMENT COMMENTS**

This planning application submitted by Bairds Malt Single Turbine Ltd is for the erection of a single wind turbine with a maximum height of 77 metres. It would appear that the prime purpose of the turbine is to generate electrical power for Bairds Malt in order to significantly reduce the company's energy expenditure. At the same time the proposed investment will reduce the carbon footprint of the operation. Accompanying the application is a socio-economic report that colleagues and I have reviewed.

I comment on the application and supporting information as follows:

1. The socio-economic report is well constructed and overall I agree with the economic impact assessment.
2. I acknowledge that **Bairds Malt provides a very valuable input to the local and wider economy** through direct employment and the supply chain contracts/linkages it has with local businesses, including relationships with a significant number of local farm businesses.
3. Bairds Malt operates in a price sensitive marketplace and I am sympathetic to the company's ambition and desire to reduce its energy costs in order to remain competitive. I know energy is a major component of its day to day operating costs and I accept that overall the turbine will significantly reduce expenditure and make the site more competitive. I note that both the covering letter supporting the application and the socio-economic report suggest a cost saving of around £800,000 per annum for the business (although the two documents differ in their reporting on the annual expenditure).
4. I accept that the turbine will help support the longer term viability of Bairds Malt.

While the proposed turbine will be very beneficial to Bairds Malt and the Angus economy, and I wish to see the company prosper, I recognise that there are other planning matters that need to be considered in determining this planning application.

Alison Smith  
Service Manager - Economic Development  
Date: 13/04/2015  
Ref: 15/01067

17 April 2015

**14/01067/full: Maltings, Peasiehill Road, Elliot Industrial Estate, Arbroath**

### **Comments of Countryside Officer on Landscape & Visual Effects**

#### **Landscape Effects**

The site is located in the Elliot Industrial Estate towards the western edge of Arbroath close to the division between Dipslope Farmland and Coast with Sand LCTs of the TLCA. The proposed turbine would be 55m to hub and 77m to blade tip.

The Dipslope Farmland LCT closest to Arbroath has lower capacity for turbines than other parts of the LCT. The area comprises modest scale landforms and features such as Kelly Den; together with the Arbirlot Conservation Area. The setting of Arbroath and coastal sensitivities further reduces capacity for wind turbines locally. Accordingly, it is considered that there is no capacity in this area for turbines greater than 50m. Closest to the coast, capacity is typically lowest.

Contrary to the opinions within the Environmental Report, it is considered that the proposed turbine would have a significant impact upon the Coast with Sand LCT. This LCT has low capacity for turbine development, with only low capacity for turbines up to 30m in height. The Environmental Report considers that the proposed turbine would be a prominent element from the Coast with Sand LCT. The proposed 77m turbine by virtue of its proximity to the coast would inevitably affect the character of the Coast with Sand LCT. Despite being outwith the Coast with Sand LCT, the turbine would be located within the open relatively flat coastal plain between Carnoustie and Arbroath. A turbine of the size proposed would become a landmark for this part of the Angus coast. It is therefore considered that the proposed turbine would have a significant effect upon the Coast with Sand LCT.

Arbroath Abbey is an important part of the Arbroath skyline. It is not much taller than other buildings in Arbroath and is therefore vulnerable to being out-competed by taller structures. Similar issues apply to the Keptie Pond Water Tower. The size and prominent location of the proposed turbine on the edge of Arbroath would adversely affect the setting of Arbroath and historic landmarks within it. The size and location of turbine relative to Arbirlot Conservation Area may adversely affect the setting of the village. There is however no visualisation which satisfactorily explores this (VP10 is closest and ZTVs show theoretical hub visibility).

The size of the turbine would be out of scale relative to smaller scale landscape features such as houses; trees and Kelly Den (see VP1, 2, 5, 8, 9, 10).

Accordingly, significant and adverse landscape effects are considered likely.

#### **Visual Effects**

The location of the proposed turbine on the coastal plain notably influences the pattern and extent of visibility. Theoretical visibility extends is more extensive along the coastal plain south, south-west and north of the turbine. Hub visibility extends are far south as Fife Ness; as far south-west as Carnoustie and as far north as the higher ground west of Lunan Bay. To the west, visibility is generally restricted by higher ground around Carmyllie. As expected, blade tip visibility would be more extensive. Much of the views of the proposed turbine would be along the open and relatively flat coastal plain; across the Firth of Tay or from higher ground. These factors together, lead to not only higher levels of visibility, but higher levels of prominence in views. This in part, contributes towards an overall lower underlying landscape capacity for wind turbine development on the coastal area.



The size of the turbine together with the prominent location would inevitably lead to significant visual effects.

### Houses

The closest affected houses are the 2 cottages at Peasiehill Farm Cottages to the north-west (326m/ 4 times turbine height). Given the size and proximity of the proposed turbine, I would agree with the ER that the houses would experience effects of major significance. At this proximity, the turbine is likely to be over-bearing and oppressive.

There are further houses to the north-west at Peasiehill and Crudie (650m to 810m/ 8 to 11 times turbine height). The ER assesses the magnitude of effects as being medium. This is considered an under-assessment given the size of the turbine and its proximity. The turbine is likely to be a dominant feature in views from these houses and therefore would also create effects of major significance.

To the south the closest houses are 10 houses at Elliot Cottages (578m/ 7.5 times turbine height). (Appendix 2.3 VP1). The ER assesses the magnitude as high and significance major. I would concur. Impacts would further be increased by the elevated position of the turbine relative to the houses. The turbine would dominate the setting of the houses.

To the north of the site, beyond the industrial estate, the closest houses within Arbroath are at Patrick Allan Fraser Street. This area is not included in the Residential Assessment, but Appendix 2.3 includes visualisations and a summary assessment. The closest houses are around 370m/ almost 5 times turbine height. Whilst there are intervening trees and buildings, Appendix 2.3 VP05 helpfully shows the proposed turbine typically protruding above these by around the rotor diameter (24m). Whilst, the Appendix assesses magnitude as high, it considers sensitivity as being low. Houses are typically high sensitivity, which would revise this assessment to major. Given the size and proximity of the turbine it is likely that the turbine would dominate houses and have an over-bearing effect.

### **Cumulative Landscape Effects**

Figure 7.14 of the ER lists nearby wind turbines either operational, consented or in planning. The closest turbine would be the consented 77m turbine at Cuthlie (4km). Overall there are a number of operational or approved turbines to the west and north-west of the proposed turbine. Together, they will create a wind turbine typology of "landscape with wind turbines". The current proposed turbine, in part due to its size, would extend this typology up to the edge of Arbroath. This would be beyond the underlying landscape capacity for this part of Angus. The proposal would therefore have significant adverse cumulative landscape effects.

Furthermore, extending the "landscape with wind turbines" typology to the coast would likely lead to cumulative seascape effects with approved offshore windfarms.

### **Cumulative Visual Effects**

The paired ZTVs within the ER demonstrate that the proposed turbine would be likely to be commonly viewed "in combination", "in succession," and "in sequence" with other wind turbines. Again, the frequency of which such interactions occur would extend towards Arbroath and the coast, leading to significant cumulative visual effects.

**Conclusion**

Unfortunately, the proposed size of turbine close to the coast; Arbroath and a number of houses would lead to significant adverse landscape, visual and cumulative effects.

**TaylorE**

---

**From:** RobertsS  
**Sent:** 29 June 2015 17:08  
**To:** TaylorE  
**Subject:** RE: Bairds Malt - Landscape Response

Ed

I would comment as follows (by the numbering on the Greencat submission):

01: Disagree. No change to opinion.

02: It is noted that the Environmental Report states that the turbine would be located within Dipslope Farmland LCT. I however did not say that the turbine would be on Dipslope Farmland. However the technical distinction referred to in the Greencat submission is accepted. Notwithstanding this, my comments on the impact upon the LCT remain unchanged.

02 (second): The built-up nature of the location is accepted, however this does not substantially mitigate effects which would result from a turbine of this size.

03: The OED definition confirms my opinion.

04: No change to opinion.

05: No change to opinion.

06: No change to opinion. My reference to coastal plain relates to the relatively flat open area parallel with the coast. It is distinct from the coastal LCTs.

07: No change to opinion.

08 -10: No change to opinion

11: Error in ER noted. No change to opinion

12: If you only consider operating turbines the assessment will be different! No change to opinion.

13: No change to opinion

14: No change to opinion

Regards

Stewart

**SJ Roberts, Countryside Officer**

Planning Service, Communities, Angus Council, County Buildings, Market Street, Forfar, DD8 3LG

---

**From:** Glen Moon [<mailto:glen@greencatrenewables.co.uk>]

**Sent:** 15 June 2015 14:41

**To:** TaylorE

**Subject:** Bairds Malt - Landscape Response

Dear Ed,

Please find attached a response to the Landscape Officer's comments.

I will send across further information on noise and shadow flicker to Steve Thomson directly today. The idea is to give him a draft to look at to check that he is happy with it before we formally submit – hopefully this will speed up the process.

I hope this is OK.

Thanks,

Glen

---

## Glen Moon

Green Cat Renewables Ltd  
Midlothian Innovation Centre  
Edinburgh  
EH25 9RE  
0131 440 9064

Website : [www.greencatrenewables.co.uk](http://www.greencatrenewables.co.uk)

Find us on [LinkedIn](#)

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Registered office: Green Cat Renewables Limited,

Covington Mill, Thankerton, Biggar, South Lanarkshire, ML12 6NE

## CaneyV

---

**From:** ClarkPR  
**Sent:** 09 January 2015 17:57  
**To:** PLNProcessing  
**Cc:** AgnewMJ  
**Subject:** Consultatio response - 14/01067/full

I refer to your consultation request regarding planning application 14/01067/full – erection of a wind turbine at the The Maltings, Peasiehill Road, Elliot, Arbroath.

The close proximity of the proposed turbine to core path 152 (as identified in the Angus Council Core Paths Plan, adopted 23 November 2010) is likely to have a detrimental impact on the amenity of the route for recreational access takers. The overall amenity value of the path is currently relatively high, being largely rural with open views over adjacent farmland. The existing industrial development has some impact on the amenity of the path, but this does not fundamentally affect its overall setting. The movement of turbine blades in close proximity to the path may also be intimidating to some users. I am not however aware of any guidance on acceptable separation distances between wind turbines and public paths.

The proposed relocation of the path, to provide a separation distance equivalent to the blade tip height, will help make the proposed turbine less intimidating to path users. Detouring the path from its current straight line, and erection of high security fencing over the current path line, will however break up the visual integrity of the path and give an overall more industrial feel to the path setting. This is particularly a concern in the context of the approved employment land extension to the west of the path. It would be preferable to retain the path within a continuous visually coherent corridor between the two areas of employment land. The situation could potentially be improved by providing a more gradual transition from the existing track line onto the new one, avoiding sharp turns, and by reinstating the secure site boundary on or close to its existing line on completion of construction.

Paul Clark  
9<sup>th</sup> January 2015

Paul Clark, Countryside Access Officer.  
Postal address:- Planning and Place, Communities, Angus Council, County Buildings,  
Market Street, FORFAR, DD8 3LG.  
Office location:- William Wallace House, Forfar, DD8 1WH.  
Telephone: 01307 473220

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: \_\_\_\_\_

Address: HATTON mill

ARBROATH

RECEIVED

11 MAR 2015

IC/KW

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date: 12/2/15

Application Ref: 14/01067/FULL

RECEIVED  
27 FEB 2015  
12/15

Dear Mr Taylor,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

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- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,



Print Name: ALAN CLARK

Address: 3 DUNOARROCH Gdns  
BROUGHTY FERRY DUNDEE  
DD5 2TD



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

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- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: 

Address: NEWTON OF GLAMIS  
BY FORFAR, ANGUS, DD8 1SB

RECEIVED

11 MAR 2015

IK/KW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

16 MAR 2015

IL/KW

Date: 6/3/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

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- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: ALASTAIR DAVID GALL

Address: GLENSKINNO FARM

MONTROSE

ANGUS

DD10 9LG

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

Date:

12 FEB 2015

Application Ref: 14/01067/FULL

14KLL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

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Yours Sincerely,



Print Name:

Address: 26 Andrew Welsh way  
Arbroath DD11 1LS

Mr David Gray  
Planning Officer (Development Standard)  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
12 FEB 2015  
IL/KU

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,

Print Name - ALUN GOURLAY  
Address: 32 THOMAS ST,  
CARNoustIE, ANGUS

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 04/02/2015

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: 

Address: 38 GRANGE PLACE,

ARBROATH, ANGUS, DD11 4EH.

RECEIVED

- 6 FEB 2015

LC/KW

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

Dear Mr Taylor,

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- Allow the business to strengthen / expand.
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- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,



Print Name: ARCHIBALD BLAIR MORRISON

Address: 8A DACHOUSIE RD

B/FERRY DUNDIE DD5 2SQ

RECEIVED

24 FEB 2015

14/11/15

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
IL/KL

Date: 10<sup>th</sup> FEB 2015

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: ASHLYN McMILLAN

Address: 21 MILLAR ST

CARNOUSTIE


DD7 7AS



Dear Sir or Madam

I object strongly  
about the wind Turbines,  
I know by my own experience  
when I come to Hospitalfield to  
buy a house, there was many I  
turned down because what was  
facing me out the window, and  
the smell and noise, we have a  
enough disruption in Hospitalfield  
A big No.

Yours Faithfully

  
6 Glamis Rd.

RECEIVED

- 4 FEB 2015

IC/KW

RECEIVED

18 MAR 2015

14KLS

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

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- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,



Print Name: BRIAN ALSTON

Address: WAINS OF USAN  
MONTROSE.

**LeslieA**

---

**From:** [REDACTED]  
**Sent:** 05 February 2015 15:52  
**To:** PLNProcessing  
**Subject:** Bairds Malt wind turbine

Dear sir/ Madam

I would like to object to the planning application for the wind turbine at Bairds Malts. My house backs onto this I am concerned for the sight and noise of this.

Thanks

Caroline Ruxton  
107 Patrick Allan Fraser Street  
Arbroath  
DD11 2lx

[REDACTED]

Sent from my iPad

Mr David Gray  
Planning Officer (Development Standard)  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
14KLJ

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,

Print Name - CARRIE ANDERSON

Address: 20 DOOCOT PARK, ARBROATH

DD11 2LN

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
IKKJ

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: MRS CLAIRE HOBSON

Address: THE BRAMBLES, BARNHEAD

DD10 9LL

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

RECEIVED

27 FEB 2015

12/10/15

Dear Mr Taylor,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.



Print Name - COLIN SMITH  
Address: 2A HUNTLY PLACE.

---

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: COLIN TAIT  
Address: 39 ELLIOT STREET  
ARBROATH.

RECEIVED

12 FEB 2015

12/11/15



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

Date:

12 FEB 2015

Application Ref: 14/01067/FULL

KRL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: DARIUSZ KOSZMIKAddress: 13 St. Ninians Road  
Arbroath

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

RECEIVED  
27 FEB 2015  
IL/KCW

Dear Mr Taylor,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,



Print Name - DAVID WEBSTER

Address: 38 GLAMIS ROAD

DUNDEE DD2 1TU.

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

Dear Mr Taylor,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: DEREK W. DEWAR

Address: 22 TRAVEBANK GARDENS  
MONIFIETH, ANGUS, DD5 4ET

RECEIVED

24 FEB 2015

JLKW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
14KL

Date: 10/02/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: DON PETERS

Address: 47 TAYLOR STREET  
FORFAR, DD8 3LP

AC36

Ellen Cromar  
27 The Steading  
Arbroath  
DD11 2NG

22/01/2015

Dear Sir

*I totally object to the wind turbine proposed to be erected at the west end of Elliot Industrial Estate by Bairds Malt.  
14/01067/FULL Erection of Wind Turbine.*

*My reasons for objecting are that it will look ugly looking from all directions of the town and approaches to Arbroath.*

*It will surely devalue all of the surrounding area within sight of this thing which is no benefit to anybody including the council.*

*Not living to far from the proposed sight, I would also object on the grounds of any noise factor.*

*It could also open the floodgates ending up in a "wind farm" area.*

RECEIVED

23 JAN 2015

12/12/15

Yours sincerely,  
Ellen Cromar.



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

Date:

12 FEB 2015

Application Ref: 14/01067/FULL

14/KLJ

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely

Print Name: GORDON WHITEAddress: 397 BROOK STREET  
BROUGHAM FERRY  
DUNDEE DD5 2DX

Letter from I M & R K Donald, 1 Patrick-Allan Fraser Street, Arbroath, DD11 2LX, received 29 January 2015, reads as follows:-

“We are against the proposed erection of the above. It will be too near a residential area. It will be unsightly and create some sound annoyance. It may also reduce the value of property in the area.”

Letter 14/01067/FULL (I M & R K Donald)



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 04.02.15

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: 

Address: 80 Brechin Road  
Arbroath, DD11 1SS

RECEIVED

6 FEB 2015

12/12W

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

Dear Mr Taylor,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: RENE S NEWAR

Address: 22 TRAVEBANK CROSS

DEARFORTH DD5 1ET

RECEIVED

24 FEB 2015

IL/KW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

20 FEB 2015

14/15

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
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- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: JAMES HUGH DUNLOP

Address: MAINS OF GLASSWELL

KIRRIEMUIR, ANGUS

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 4/02/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project



Print Name: JOAN E HAINSWORTH

Address: 25 ST VIKERS GARDENS  
ARBROATH

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 26/2/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: JOHN MURKIE

Address: HAYHES OF FINNAN  
FORFAR, ANGUS.

RECEIVED

2 - MAR 2015

1211W

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

RECEIVED

27 FEB 2015

12/12/15

Dear Mr Taylor,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.



Print Name - JONATHAN CLARK

Address: The School House, Kinnaird  
Perthshire PH14 9QY

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 5/3/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: KATH HEARRINGS  
Address: 47 BAZZIN ROAD  
KIRRIEMUR  
DD8 4NE

RECEIVED

9 - MAR 2015

12/12/15



Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date: 17/2/15

Application Ref: 14/01067/FULL

RECEIVED  
27 FEB 2015  
12/12/15

Dear Mr Taylor,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
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- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

[Redacted Signature]

Print Name: LINDA CLARK

Address: 3 DUNDARROCH Gdns

BROUGHTY FERRY DUNDEE

DD8 2TD

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

12 FEB 2015

LKU

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,



Print Name: LUKASZ SLIZEWSKI

Address: 39 D WEST NEWGATE

DD11 1BZ ABBROATH

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
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- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: LYNNE SPRINGORUM

Address: 24 MARYTON

NEWPORT-ON-TAY, FIFE

Marjory Robertson  
36 Doocot Park  
Arbroath  
DD11 2LN

22<sup>nd</sup> January 2015

Head of Planning & Transport  
County Buildings  
Market Street  
Forfar  
DD8 3LG

Ref : 14/01067/FULL Erection of Wing Turbine at Bairds Malt, Elliot Industrial Estate,  
Arbroath.

OBJECTION TO PLANNING APPLICATION.

Dear Sir

I object to the erection of this Wind Turbine for the following reasons :-

1. It will be environmentally unfriendly due to its visual impact on the landscape for miles around.
2. It will encroach on what is an old dirt road used by many for walking.
3. I believe it will also be environmentally unfriendly due to a noise factor.
4. It will have no benefit to the community in general, in fact, it will have the opposite effect.
5. It will be unsightly and could have a major impact on the town's tourist trade being so close to the west links, caravan sites and golf course.
6. It may encourage further unwanted projects of this kind in the future.

Yours sincerely,



Marjory Robertson.

RECEIVED  
23 JAN 2015  
ILJKW

Mr David Gray  
Planning Officer (Development Standard)  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
JLKU

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,

Print Name - MARTA KOZNIK

Address: 13 ST. NINIANS ROAD

ARBROATH DD 11 5DG

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 04/02/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

RECEIVED

- 6 FEB 2015

12/11/15

Print Name: 

Address: 28 THE MALTINGS, VICTORIA  
STREET, CARDOUSTIE, DD7 7LF

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Geoff Taylor

Address: 95 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We strongly object to the proposal to site a Wind Turbine at the Bairds Maltings Site on the grounds of the visual and noise impact it will have on our property. We also see this proposal as having a negative impact on wildlife especially the local bird population. The detrimental effect a Wind Turbine will have on our outlook and more importantly the value of our property is enormous. After having endured many years of the Seed Crusher factory and the negativity it brought to the whole of Arbroath we once again are to be asked to accept a Nation wide controversy which is the Wind Turbine. I am quite sure there are many other avenues that Bairds could pursue which will reduce their running costs without blighting the local population with a Wind Turbine. For those that have a say/vote in whether this goes ahead please ask yourself if YOU would want a Wind Turbine directly overlooking your property.

Aileen & Geoff Taylor

93 Patrick Allan-Fraser Street

Arbroath



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Miss Aimee Kubicki

Address: 101 Patrick Allan Fraser St Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to Bairds Malt plans to erect a wind turbine so very close to where I live.

It will protrude above all the existing buildings and be visually overpowering and spoil the surrounding landscape.

Noise from it could also be amplified by all the metal buildings in close proximity.

The old road down the side of the factories will also be spoiled by its construction.

Not a good prospect for Arbroath and its surrounding areas.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Miss Elizabeth Strachan

Address: 9 Kinghorne Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As a resident of the Hospitalfield estate I wish to STRONGLY OBJECT to the proposed erection of a wind turbine at Elliot.

This would be detrimental to the environment because it would be visually unsightly, although it is stated that there would be no extra noise pollution I believe that this would not be the case. I have spoken with people who live adjacent to the Dundee wind turbines who are constantly disturbed by them. I think that the house prices in the area will fall and property will be more difficult to sell. I am concerned for the local bird population as this will be in their flight path especially the geese from the Montrose basin and the local starling population.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Miss Julie Webster

Address: 2 Hospitalfield Gardens Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir/Madam,

I write to formally oppose the erection of the wind turbine at Bairds Malt, Arbroath.

My main reasons for opposing are:

1. Detrimental impact to the valuation and appeal of my home.

I only purchased my home in Hospitalfield in 2013. Would I have purchased it if there were already a wind turbine situated so close..... probably not. I cannot be alone in my thinking therefore I'm sure this would put others off purchasing property in the area in future.

2. Noise

I accept the noise already created 24 hours per day by Barid's Malt, after all, it was already situation there when I moved. However, to even consider adding to this noise already generated by the company is extremely inconsiderate to those residents living in the area.

I would like to add that I am not opposed to wind turbines in general, but feel very strongly about them not being erected in residential areas.

Yours faithfully,

Julie Webster

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Miss SAMANTHA MITCHELL

Address: 24 ST ANDREWS CRESCENT ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: i object for reasons being, arbroath is a tourist town and they are not attractive to look at, noise pollution, devalue the property in the area of hospitalfield estate.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs Bob Turner

Address: 68 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I write to express our objection to the proposed erection of a wind turbine at Bairds Malt, Arbroath. We are concerned with the visual impact this will have on the surrounding area and the additional noise this will create. There will also be a detrimental impact on the valuation of our property if this wind turbine is erected.

Bob & Emma Turner

## LeslielA

---

**From:** PLANNING  
**Sent:** 13 January 2015 11:24  
**To:** PLNProcessing  
**Subject:** FW: baird maltings

**Sandra Cameron, Clerical Officer, Communities, Planning & Place, Angus Council, County Buildings, Market Street, Forfar DD8 3LG; Tel: 01307 473342; E-mail: [camerons@angus.gov.uk](mailto:camerons@angus.gov.uk)**

---

**From:** GORDON SIMPSON  
**Sent:** 12 January 2015 16:14  
**To:** PLANNING  
**Subject:** baird maltings

we are mr and mrs g w g simpson from 113 Patrick ALLAN fraser st in Arbroath and we would like to lodge our objections to the planning application for a wind turbine by baird maltings. The following are our reasons for our objections

.1 the impact this structure is likely to have on the value of our property it would reduce the likelihood of being able to sell our property

2the noise that such a structure will create we have been in close proximity to several of these structures on hill walks and in several places in the country side and the noise they generate is profound.

3The visual appearance ,this being much higher than the buildings which are there just now and arbroath does not need anything else to put prospective tourists coming to the town this structure will be seen from all over Arbroath.

4 It will have a detrimental effect on he wildlife in the area there is many birds around this site.

5 The disadvantages far out weigh any advantage this would have for the town of Arbroath let alone the residents of hospitalfield the last thing we want is another situation like the seed crushers saga.

Mr and Mrs G W G S impson

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr.and Mrs Iain Findlay

Address: 7 Glamis Road Arbroath

### Comment Details

Commenter Type: Councillor

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:We object to the above application for the following reasons

- 1.They will spoil the look of the landscape.
- 2.No doubt this will be the first of many turbines if this one is allowed to go ahead.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr & Mrs Martin & Mary Fox

Address: 103 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As residents of a property backing on to the 'Maltings' we are strongly opposed to this application on the grounds that it will have a significant adverse visual and noise impact on nearby residents as well as having a detrimental effect on house values and the ability to sell residential property in Hospitalfield.

Volume 2 Appendix 2.1 confirms that the proposed development will have a permanent, direct and negative effect on Patrick Allan Fraser Street which can be extrapolated to include the rest of Hospitalfield. Additionally, Appendix 2.1 identifies moderate and major negatives effects from numerous surrounding viewpoints. We are certain that this proposal will have a negative impact on Arbroath with the subsequent potential impact on tourism, e.g. the nearby caravan sites which bring much needed revenue to Arbroath.

We do not accept that noise levels will be below or on a par with existing background noise from the Maltings. The scale of the proposed development will mean that the actual turbine and blades will not be screened by existing buildings. This is confirmed by the photomontages in Appendix 2.3. Whist walking or cycling in close proximity to large wind turbines we have experienced the noise they make and we have no doubt that the noise generated by this development would add to and be in excess of the existing noise from the Maltings which since recent developments has noticeably increased. Additionally, the repetitive swishing and whumphing noise made by wind turbines has the potential to be quite stressful and damaging to long-term health. We are also concerned that added and increased noise will mean that we are unable to enjoy the amenity of our garden during periods of good weather.

Having endured the operations of the oil seed crushers some years ago we trust that the planning authority will recognise the impact of such an unwelcome development in close proximity to a long established residential area and refuse this application.

Robert and Mrs R Cargill  
Davayne  
Elliot  
Dundee Road  
Arbroath DD11 2PE  
20<sup>th</sup> January 2015

Application by Baird's Malt to develop wind turbine at Elliot industrial Estate

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's Malt Arbroath, we wish to state that we strongly object to this proposal due to the following reasons.

This development will permanently alter and impair the landscape.

This development will create additional noise.

This development will produce a shadow flicker effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers cyclists and equestrian traffic.

This development produces no benefits to residents other than the applicant.

Acceptance of this development would set a precedent for further applications.

Yours Faithfully.

Robert S Cargill

Mrs S Cargill

RECEIVED  
22 JAN 2015  
IL/KW

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr and Mrs Ronald Birse

Address: 50 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We wish to object to a wind turbine being erected because it would cause such an eyesore at the edge off a residential housing area. Also knowing what we have read about turbines they are susceptible to high winds which could cause it to go out off control, causing a major accident.

The blades could also affect the flight of the wild geese as I see 200/300 pass over here every day during the winter months.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Albert Smith

Address: 17 Doocot Park Hospitalfield Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As Dr Richard Broadbent admits in his letter dated 08/01/2015 sent to the residents of Hospitalfield that there is already noise pollution from the Bairds Malt site the added noise from a working turbine will be in addition to the current from this site as it will be at a different noise frequency.As he also states this operation runs 24/7 there will be no visual or noise relief for local householders.This site has expanded greatly from the original Moray Firth Maltings ownership and should not be allowed to expand being so close to a residential development.We also now have a smell of malt barley during the summer when in full operation.Please record my objection to this blight on our landscape.

AC64  
27, ELLIOT TERR.  
ARBROATH  
ANGUS  
DD11 4AB  
20/1/15

RECEIVED

23 JAN 2015

IL/KW

Application by Baird's Malt to develop wind turbine at Elliot industrial Estate

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's Malt Arbroath, we wish to state that we strongly object to this proposal due to the following reasons.

This development will permanently alter and impair the landscape.

This development will create additional noise.

This development will produce a shadow flicker effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers cyclists and equestrian traffic.

This development produces no benefits to residents other than the applicant.

Acceptance of this development would set a precedent for further applications.

Yours Faithfully.

A large black rectangular redaction box covers the signature area, obscuring the name and any handwritten notes.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Alexander Thomson

Address: 49 Patrick Allan-Fraser Street ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: During their open day, I asked the representative of Bairds Malt whether the power derived from the Wind turbine would meet all of their projected needs for power. The answer was non committal. I also asked if there was a surplus of power could this not be fed into the grid and allocated to the residents of Hospitalfield estate. Their answer was again non committal also advising that this may need further investigation and further planning permission.

I therefore object to this application on the following points.

- 1 They could not or would not advise me on exactly what their power needs entailed both for the present and/or for their future needs. I believe they withheld the answer to my question.
- 2 I asked if they were likely to build another Wind turbine if when they received permission for this one and there was need for another Turbine would they apply for a second turbine. Their answer was NO as there was not enough land to build further Turbines. No mention was made as to Bairds Malt Acquiring further land from its'neighbours as I believe has been asked of from Peasiehill Farm.
- 3 The visual outlook both of residents in Hospitalfield estate and of anyone approaching from the east is likely to be an eyesore and a blot on the landscape.

All of this purely for profit to Bairds Malt and with no increase in benefit to the people of Arbroath. Lets NOT have another fiasco as we had with the Oil Seed Rape Factory that was approved by councillors who did NOT have the full facts at planning stage.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Allan Buick

Address: 9 Glamis Road Hospitalfield Arbroath

### Comment Details

Commenter Type: Community Council

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the height as it is so close to a residential area.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs Andrew & Moira Cook

Address: 84 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As residents of a property looking onto the 'Maltings', we are strongly opposed to this proposal and wish to make a formal objection on the following grounds:-

We believe that the proposal for a wind turbine is inappropriate for this location and will have a detrimental effect on the community of Arbroath, the landscape, the tourist industry and the local habitat/birds.

Wind turbines can make people ill with the continuous noise. They are an eyesore and people do not want them near their homes - this could reduce the value of our homes.

The wind turbine is far too large, too close to our homes and will be an alien structure on the local environment.

It would adversely affect walkers and be unsafe.

There appears to be an inexplicable obsession with wind turbines, without regard to the devastation which these hopelessly inefficient machines create.

The destruction of birds is inevitable - we have the geese here all winter and they fly all around this area for several months at a time.

We trust that the Planning Authority will recognise sound common sense and technical awareness regarding this application and refuse permission.



The residents of Hospitalfield lived with the Oil Seed Crushers on our doorstep for several years - during this time, we were exposed to regular obnoxious odours, noise pollution and a general intrusion in our lives. Please do not expose us to a new and unpleasant intrusion.

We conclude that the proposal is economic nonsense (why are the Americans now decommissioning their wind turbines??) and that the environmental costs would be huge for future generations.

**LeslieA**

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**From:** [REDACTED]  
**Sent:** 05 February 2015 16:04  
**To:** PLNProcessing  
**Subject:** Bairds Malt wind turbine

Good Afternoon

I would like to object to the planning application for a wind Turbine at Bairds Malt. I live at the back of this I am cornered about the look and noise and my property valuation going down.

Thanks

Andrew Ruxton  
107 Patrick Allan Fraser street  
Arbroath  
DD11 2lx

[REDACTED]

Sent from my iPad

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr andrew viviers

Address: 1 Access From ZU360-1 To Arniefoul Cottages, Arniefoul, Glamis, Angus DD8 1UD

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I write to object based on the detrimental health effects this application will probably have on its turbine neighbours, based on my own experiences and the 5 reasons listed below.

The effects of Infrasound and Low Frequency Noise (ILFN) are cumulative, and individuals are affected by ILFN in different timescales, but the bottom line is that if you have a life threatening ailment, or are susceptible to one, and live near a wind turbine, then your chances of recovery are greatly diminished, whether you have signed a non disclosure agreement or not.

Cancer Clusters and Heart Seizure Hotspots are now being observed around wind farms. There truly are Nae pockets in a shroud.

Your pets, livestock and local wildlife could also be seriously affected.

Should this application be allowed, in the interests of public health, please ensure that ILFN monitoring before and after turbine erection is a required condition.

With regard to subsidy payments, this Jan 15 2015 article applies equally to the UK  
<http://stopthesethings.com/2015/01/15/parker-gallant-wind-power-outfits-christmas-bonanza-in-ontario/>

### 1. THE LINK BETWEEN VIBRO ACOUSTIC DISEASE (VAD) AND WIND FARM SYNDROME (WTS)

The peak frequencies emitted by wind turbines are below 5 Hz.

VAD is an acknowledged medical disease caused primarily by the frequencies of Infrasound (0 - 20Hz) and Low Frequency Noise (20 - 500Hz).

These frequencies are commonly grouped together as ILFN (0 - 500Hz). [1]

Respiratory pathology induced by ILFN is not a novel subject given that in the 1960's, within the context of U.S. and U.S.S.R. Space Programs, its existence was being reported. [2]

Central nervous system disorders in workers exposed to ILFN were first observed 25 years ago among aircraft technicians. Concurrently, respiratory pathology was identified in these workers, and later reproduced in ILFN-exposed animal models. [3]

In 1987, the first autopsy of a deceased VAD patient was performed. The extent of ILFN induced damage was overwhelming, and the information obtained is, guiding many of the associated and ongoing research projects. [4]

In both human and animal models, ILFN exposure causes thickening of cardiovascular structures.

Pericardial thickening with no inflammatory process, and in the absence of diastolic dysfunction, is the hallmark of VAD.

Depressions, increased irritability and aggressiveness, a tendency for isolation, and decreased cognitive skills are all part of the clinical picture of VAD.

In VAD, the end-product of collagen and elastin growth is reinforcement of structural integrity. This is seen in blood vessels, cardiac structures, trachea, lung, and kidney of both VAD patients and ILFN-exposed animals. This means that blood vessels can become thicker, thus impeding the normal blood flow. Within the cardiac structures, the parietal pericardium and the mitral and aortic valves also become thickened

When echocardiography, brain MRI or histological studies are performed, structural changes can be identified, all consistently show significant changes in VAD patients and ILFN-exposed animals.

Wind Turbines are known to emit a broad spectrum of ILFN frequencies, with peak frequencies at below 5Hz.

In Portugal ILFN has been extensively researched, and occupational VAD symptoms have been grouped according to length of exposure during work hours.

Those living and working near wind turbines are obviously exposed to Infrasound 24/7. Exposure at night can often result in considerably sleep deprivation.

The detrimental health effects of sleep deprivation are well recognised medically.

The Hayes Mackenzie 2006 report which is often quoted by Government and Council officials gives a time to symptom chart for VAD. [5] The chart is shown below, and is based on occupational exposure to noise (ILFN).

## VAD symptoms

Stage 1 (Mild) 1-4 yrs: Slight mood swings; Indigestion; Heart burn; Mouth/throat infections; Bronchitis.

Stage 2 (Moderate) 4-10 yrs: Chest pain; Definite mood swings; Back pain; Fatigue; Fungal, viral & parasitic infections; Inflammation of stomach lining; Pain and blood in urine; Conjunctivitis; Allergies.

Stage 3 Severe (10 + yrs): Psychiatric disturbances; Haemorrhages of nasal, digestive & conjunctive mucosa; Varicose veins & haemorrhoids (piles); Duodenal ulcers; spastic colitis; Decrease in visual acuity; Headaches; Severe joint pain; Intense muscular pain; Neurological disturbances.

Among the most serious consequences of untreated VAD are rage-reactions, epilepsy, and suicide.

As a rough calculation, without considering sleep deprivation, the time of symptom appearance for ILFN induced WTS should be the VAD time, reduced by a factor of around 4.2 (turbine neighbours who live and work near turbines, 24hrs x 7days x 48working weeks = 8064 hrs exposure per yr, assuming 4 weeks holiday away from turbines; occupational exposure, 8hrs x 5days x 48weeks = 1920 hrs exposure per yr.  $8064 \div 1920 = 4.2$ ).

Thus a 4yr VAD symptom exposure would manifest in 1yr for a WTS exposure, and a 10 year VAD symptom in 2.5yrs for WTS, which indeed appears to be the case.

## IFLN induced WTS

Less than 1 yr: Headaches; Dizziness; Sleep deprivation; Haemorrhoids; Umbilical hernia; High blood pressure; Fatigue; Tinnitus; Vertigo; Poor concentration & memory; Slight mood swings.

1-4 yrs: Nausea/seasickness; Panic attacks; Annoyance, anger & aggression; Increased agitation of those with Autistic Spectrum Disorder and ADD/ADHD; Increased blood sugar levels.

4-10 yrs: Thickening of pericardium and blood vessel walls plus other soft tissue damage.

Many other chronic health problems are thought to be created or accelerated, probably by infrasound-induced increased levels of cortisol (which lowers our immune system).

On 5 Sept 2014, the Waubra Foundation wrote to NSW Planning Assessment Commission

regarding the Gullen Range Wind Development [6]. This letter contains much important information regarding ILFN.

The facts are clear:

1. Wind turbines emit ILFN, and can do so even when the blades are not turning.
2. ILFN is harmful to humans and other life forms, and can kill.
3. In the interests of Public Health, the Scottish Government and local Councils should immediately impose a condition on turbine applications that ILFN is measured before and after turbine erection.
4. ILFN monitoring should be a mandatory tool that is used to assess any reported health effects from turbines.

#### References

1. <http://www.ncbi.nlm.nih.gov/pubmed/17014895>
2. <http://www.ncbi.nlm.nih.gov/pubmed/17315094>
3. <http://www.ncbi.nlm.nih.gov/pubmed/16969569&#8232;>
4. <http://www.ncbi.nlm.nih.gov/pubmed/15273020>
5. <http://www.hayesmckenzie.co.uk/downloads/LF%20and%20Infrasound%20Noise%20Immission%20from%20Wind%20Farms%20and%20the%20Potential%20for%20Vibro%20Acoustic%20Disease%20-%20Malcolm%20D%20Hayes.pdf>
6. [http://waubrafoundation.org.au/wp-content/uploads/2014/09/GRWF\\_WF\\_Submission\\_to\\_PAC\\_Final\\_Sept\\_2014.pdf](http://waubrafoundation.org.au/wp-content/uploads/2014/09/GRWF_WF_Submission_to_PAC_Final_Sept_2014.pdf)

## 2. INFRASOUND BULLET POINTS

People with a blocked or anatomically small helicotrema (a narrow pathway in the cochlea of the ear) have an increased sensitivity to Infrasound and Low Frequency Noise (ILFN), as are those who are susceptible to car/sea/motion sickness.

The main resonant frequencies of a persons internal organs are below 5 Hz. The peak frequencies emitted by turbines are below 5 Hz. Earths resonance frequency is 7.83 hertz, exactly the same as the alpha waves of our brain (which controls our creativity, performance, stress, anxiety and immune system).

The frequencies to which the various brain areas respond vary from 3 to 50 Hz, such as: touch 9 Hz; coordination 10 Hz; sound 15 Hz; subconscious thought 20 Hz; visual images 25 Hz.

What specific frequency do: 6-7 Hz ringing in ears, increased blood pulse, fatigue, tightening in the chest; 6.6 Hz causes depression in most people; 8.6 - 9.8 Hz tingling sensations / sleep inducing; 10.8 Hz causes riotous behaviour; mixed 17 & 70 Hz harmful biological effects.

Some people are sensitive to ILFN out to 30km from a turbine(s).

ILFN frequencies between 3 and 12 Hz cause Rapid Eye Movement (REM) sleep disruption and general sleep deprivation. This in turn can: increase mood swings (happy/violent); inhibit or modify dreams; make people depressed and/or apathetic. The detrimental health effects of sleep

deprivation are well documented.

ILFN exposure can cause the body to secrete cortisol which increases blood pressure and blood sugar levels, and has an immunosuppressive action. A suppressed immune system will allow existing health problems to accelerate and make it easier for new ones to be created. The effects are worse if exposed to ILFN during sleep hours.

Our bodies try to protect vital organs from ILFN bombardment by laying down extra collagen, causing a thickening of the pericardium and blood vessel walls for instance, which will also increase the likelihood of life threatening health problems.

The wavelength of ILFN at 1Hz is 340mtrs. 5Hz is therefore 68mtrs. The basic calculation for room wall dimension resonance is half the wavelength, but remember: an attic could extend the whole length of a house, thus if a house is 14 mtrs long, wall resonance could be caused by ILFN at around 12Hz; internal walls can be very thin and not form part of the house foundations; diagonal room measurement is also important. All this may help explain why infrasound is often more noticeable in the smallest room usually the cludgie (loo; often has an outside wall).

Temperature inversion (temperature rising with height before cooling usually around dawn and dusk) can cause sound which would normally dissipate into higher atmosphere to be refracted down. The curve of this sound usually comes back to ground level at about 5km distance from the turbine. If ILFN follows this pattern, it will join the other ground hugging infrasound, increasing the potential danger. ILFN does similarly bounce off cloud base etc.

Audible sound is emitted from turbines in a butterfly wing shape, with minimal noise directly downwind, upwind, right or left. Larger forewings are downwind. Infrasound may do the same. Turbines can emit ILFN even when the blades are not turning. A gentle breeze can cause the tower and/or blades to resonate.

Many people who believe they are suffering adverse health effects from wind turbines are hesitant to report their symptoms due to the manner in which their claims have often been discounted or ignored by the wind industry and government officials (Hansard, 2009, pp.G-516, G-547). Experts contend that the quantity, consistency, and ubiquity of the complaints constitute epidemiological evidence of a strong link between turbine noise, ill health, and disruption of sleep (BMJ2012; 344:e1527).

Individuals should not have to prove the effect, only perceive it. Self reporting is an important tool in the process.

The World Health Organisation (WHO) considers a sleep journal as a valid tool for documenting sleep disturbance.

On 21 Jan 2013, the State of Wisconsin (USA) imposed a moratorium on industrial turbines until further health research is conducted.

On 7 Nov 2013, a Falmouth judge (USA) ordered local turbines to cease operating between 7pm and 7am and all day Sunday in order to avoid irreparable physical and psychological harm to local residents.

Over-exposure to ILFN can cause short/long term memory loss, skin problems, and weaken the immune system.

### 3. RECENT USES OF DIRECTED ILFN

The use of directed ILFN is a known weapon and interrogation aid. It is an untraceable murder weapon, as it leaves no evidence of its use on the victim.

ILFN becomes particularly deadly during the early morning sleep hours. This is when the body normally produces the lowest levels of Cortisol. Artificially stimulating Cortisol production during this time disrupts the bodys normal Cortisol production in the worst possible way. In effect, the sleeping body perceives infrasound as a threat and elevates Cortisol production to cope. Since one is asleep, the Cortisol is not used, and remains in the body, damaging life-essential body functions.

Prolonged Cortisol production in our bodies eventually causes death. [1]

I understand that some of the recent uses of directed ILFN are:

Greenham Common, UK. 1984 (mostly women).

In the summer of 1984, more than 2,000 British troops suddenly pulled back, leaving the fence unguarded.

Peace activist Kim Besley recalls that as curious women approached the gate, they started experiencing odd health effects: swollen tongues, changed heartbeats, immobility, feelings of terror, pains in the upper body.

Besley found her 30-year-old daughter too ill to stand. Other symptoms typical of electromagnetic exposure included skin burns, severe headaches, drowsiness, post-menopausal menstrual bleeding and menstruation at abnormal times. Besleys daughters cycle changed to 14 days and took a year to return to normal.

Two late-term spontaneous miscarriages, impaired speech, and an apparent circulatory failure prompted the women to begin monitoring for a directed-energy beam. Using an EMR meter, they measured beams sweeping their camp at 100-times normal background levels. [2]

## 2. Iraq (2003 to present)

Very Low Frequency (VLF) weapons include the dozens of poppers and domes deployed in Iraq, which can be dialed to long wave frequencies capable of traveling great distances through the ground or intervening structures. As air force Lt Col. Peter L. Hays, Director of the Institute for National Security Studies reveals, Transmission of long wavelength sound creates biophysical effects; nausea, loss of bowels, disorientation, vomiting, potential internal organ damage or death may occur.

Lt Col Hays calls VLF weapons superior because their directed energy beams do not lose their hurtful properties when traveling through air to tissue. A French weapon radiating at 7 hertz made the people in range sick for hours.

Such variable effects have been known scientifically since 1963, when electromagnetics researchers Dr. Robert Beck found that exposure to certain frequencies sparks riotous behaviour, while other frequency beams can cause a sense of well-being or deep depression.



The recovery rate from directed ILFN exposure among US troops (they tend to lose the plot, wander off and go AWOL) seems to be about a day or so, whereas the locals are not getting over it in less than a week or more on average. [2]

3. O2 plus the 2012 Olympics. London.

Long Range Accoustic Devices (LRAD) have been photographed at the O2, and were installed on the Thames during the 2012 Olympics. There is little doubt that these communication devices can also utilise ILFN for crowd dispersement. [3]

4. Gaza (ongoing)

There are several reports of ILFN weapons (LRADs) being used by the Israel against Palestinians in Gaza. The combination of low frequencies at high intensities can create discrepancies in the inputs to the brain. Basically the brain receives a signal that your body has lost balance. You feel like you are tilting even when you are not. The discrepancies can cause headaches and nausea it simulates seasickness. [4]

5. Fukushima 2011

Directed ILFN at around 2.5 Hz can cause earth tremors, earthquakes, landslides, and will increase lightning (particularly in clouds formed on sprayed bevy metals) . Watch the 7 min video here [5]. Since 2011 US military presence in Japan has increased considerably.

[1] <http://www.darkgovernment.com/news/infrasound-stress-inducing-weapons/>

[2] <http://www.jimstonefreelance.com/beammed.html>

[3] <http://motherboard.vice.com/read/a-history-of-using-sound-as-a-weapon>

[4] [http://www.multistalkervictims.org/catchcanada/literature/brochure/CATCH/Scream\\_Article.pdf](http://www.multistalkervictims.org/catchcanada/literature/brochure/CATCH/Scream_Article.pdf)

[5] <http://www.geoengineeringwatch.org/was-haarp-a-factor-in-the-fukushima-earthquake/>

4. ARK HILL WIND TURBINES - ONE YEAR ON

(8 x 80m Enercon E48 turbines. Mar 2013 4 April 2014)

I live at Arniefoul which is 5km East of the Ark Hill wind turbines and 1.6km West of the proposed Govals wind turbines (6 x 87m turbines). The prevailing wind is from the West.

Ark Hill was commissioned on 5 March 2013 and at that time I started to have continuous headaches with some light-headedness and tinnitus. Further to this, I also started to suffer frequent sleep disturbance. When I awoke I could often hear the whooshing of the turbine blades. Assuming it was the audible sound that was disturbing me, I moved my bed further away from the window and slept with the window closed. This made no difference to my sleep deprivation usually being woken at around 3am until 5am. With the window closed I rarely hear the turbine noise, but I can sometimes feel their rhythm and therefore deduce that it is an inaudible noise (Low Frequency Noise and Infrasound) that is causing the lack of sleep.

In June 2013 I had two dizzy spells when out walking on the hills surrounding Arniefoul. It was at this time I noticed a correlation between the turbines, the wind direction and the above symptoms. My tinnitus became constant and on some nights extremely loud.

My symptoms appear to be worse when there is a Southerly wind. The Ark Hill turbines rotate clockwise and therefore it is probably an emission during the down stroke that creates the harmful effects. This suggests it may have little to do with the supporting structure and therefore an upwind or downwind design of turbine will make little difference.

Surprisingly, the prevailing Westerly wind seems to cause slightly less symptoms than a Southerly wind. Turbine noise, however, is most audible when there is little prevailing wind at ground level and at treetop level, but sufficient wind at turbine blade area to turn the blades at a critical speed. In similar conditions to these, when there is an Easterly wind we can easily hear traffic on the A90, 5km to our East, even though there is the huge bund of the Sidlaw Hills between us.

A North or East wind causes slightly less symptoms again, although should the Govals wind turbines be erected, I expect to suffer greatly from those turbines during these wind directions.

January and February 2014 were particularly bad months with predominately Southerly and Westerly winds causing much sleep deprivation, loud tinnitus, lack of concentration and irritability.

On 9 February 2014, I started recording my blood pressure morning and evening. It fluctuates considerably with a recorded high of 185/105. On 28 March for instance, after several days of Easterly wind, it was at a more acceptable 140/83. There appear to be correlations between wind, atmospheric and weather conditions.

Whilst my body may be building some form of resistance to the turbine noises (audible and inaudible) I also believe it is getting more sensitive in certain ways. I sometimes get my turbine headache out to at least 10km from the turbines. Also, I have recently noticed I need to clear my ears more frequently, similar to going up in an airplane or scuba diving.

From 6 - 12 March we stayed near Tarfside, Glen Esk (currently no turbines near there). All my symptoms reduced noticeably, with my blood pressure reaching a low of 136/81.

An obvious option is to sell my property and move (where to?). My work is in the local area and therefore this is not really a business option. Nor is it an emotional option since my family has enjoyed being at Arniefoul for nearly a century.

I have heard of landowners with turbines who now regret having turbines on their land, yet are unable to speak out due to non disclosure clauses in their contracts with developers. Also, I suspect that there are many people living near wind turbines who suffer similar conditions to mine but who remain silent for fear of property devaluation, tenancy or employment concerns, and the

like.

I am sure that should the Govals and Frawney (5 x 80m, same make as Ark Hill and West Knock Farm, Buchan) wind turbines be erected, with Forfar and Letham being on the down-wind side, there will be people with similar sensitivity as myself who will suffer. Children are thought to be more sensitive to turbine noises than adults.

People sometimes say that I look well considering the symptoms I describe. I am reluctant to take drugs/medication, with their own potential side effects, when I do not believe they are treating the root cause. I have always made considerable efforts to maintain a high level of fitness.

I understand that:

Low frequency noise and Infrasound (such as emitted by wind turbines) are sound waves that are felt by the body rather than heard, probably by the utricle. Depending upon the amplitude or intensity, it produces feelings of extreme discomfort, a feeling that the body is vibrating. Depending upon the frequency and intensity, infrasound can keep you awake, or induce sleep. Therefore, it can cause sleep deprivation.

Infrasound induces stress and causes the body to secrete the hormone Cortisol. This effect is a medically recognised danger of long-term infrasound exposure.

Cortisol, plays a vital role in preparing our body for stressful fight or flight episodes. It increases blood pressure and blood sugar levels, and has an immunosuppressive action that provides needed alertness and energy during stressful experiences. However, during long term stress, or if Cortisol production is prolonged, its effects on the human body can become severe. A weakened or suppressed immune system will allow existing health problems to accelerate, and make it easier for new ones to be created.

Exposure to infrasound during early sleep hours can be particularly harmful. This is when the body normally produces the lowest levels of Cortisol. This might explain my 3am awakening and subsequent wakefulness. Artificially stimulating Cortisol production during sleep means that the Cortisol is not used and remains in the body, potentially damaging essential body functions.

A sound wave in air is a sequence of pressure changes. A sound wave in a liquid or solid is more like a vibration. This helps explain how Low Frequency Noise and Infrasound travel great distances and easily pass through solid walls, and can set up vibrations or resonances in rooms and body cavities.

There is well-documented and peer-reviewed evidence of the detrimental health effects that turbine emissions have on humans. It is unethical to expose people to something already suspected of being harmful.

Where is the Duty of Care?

Andrew Vivers

Arniefoul, Glamis, DD8 1UD

4 April 2014

Email from a Glamis Community Councillor - Received 5 April 2014

Dear Andrew

I am very surprised you suffer thus from the wind farm as we live closer and never notice such symptoms. Perhaps your tinnitus is from your army career, as my tinnitus is from my many youthful days loading on the grouse moor. If I was that ill I would not publicise the fact - what do you hope to achieve by such a leaflet?

I am delighted Juliet is not mentioned in your catalogue of ailments, but you should have included a mention of your deteriorating mental state.

I suggest you should simply sell up and move, as the Govals wind farm will surely be much closer to you than Arkhill wind farm

Kind regards John

(note: John is a renewables energy consultant, ex director of Ark Hill Wind Farm, ex factor of Strathmore Estates [25% ownership of Ark Hill], and a Glamis Community Councillor)

Addendum 14/4/14

A major achievement of distributing the above "Ark Hill - One Year On" leaflet, was that an acoustics engineer has come to stay for two nights.

I understand that:

There appears to be a correlation between my being woken and subsequent wakefulness, and peaks in low infrasound frequencies up to 3Hz.

The peak frequencies emitted by turbines are typically less than 5Hz. Our UK legislation on this matter, ETSU-R-97, is totally inadequate since it is only concerned with 'audible' noise, ie. above 20Hz (few people can hear sounds below 20Hz).

The fact that we can not hear a sound does not make it any less harmful.

Audible sound attenuates (decreases in energy/volume) at a rate of minus 6 decibels (dB) per doubling of distance from the source. Infrasound attenuates at minus 3dB per doubling of distance, out to about 50km (which is probably why our Ministry of Defense has opposed wind turbine applications within 50 km of the Eskdalemuir Seismic Array). Also, infrasound tends to have more of a ground hugging nature and does not readily dissipate into the high atmosphere. This helps explain why the effects of infrasound are noticed at much greater distances than audible sound.

For humans, the annoyance threshold for audible sound is around 2dB. Interestingly, the annoyance factor does not then increase with increasing volume/energy.

Turbines can emit infrasound even if the blade is not turning. A gently breeze can cause the tower and/or blades to resonate and emit infrasound.

Depending on various factors, a single turbine can emit as much infrasound as a large wind factory. Ark Hill (8 turbines) for instance, was at times comparable to a 100+ turbine wind factory. The fact that industrial sized turbines emit Infrasound/Low Frequency Noise (ILFN) can not be disputed.

The fact that ILFN is harmful to humans can not be disputed.

There is ample peer-reviewed evidence from around the world that "proves beyond reasonable doubt" that wind turbine neighbours experience detrimental health effects.

The logical conclusion is that the ILFN emissions from turbines are causing the ill health, however, even if it is not, turbines should be dismantled until the cause is found and rectified.

The wind industry make claims similar to: 'Turbines are not known to cause harm to humans'. The above information must cast considerable doubt on their claims. Also, their statements are certainly not the same as saying "Turbines are known not to cause harm to humans"

It is unethical to expose people to something already suspected of being harmful. I ask again, "Where is the 'Duty of Care'?"

### 3. WIND TURBINE SYNDROME (Excerpts from letters to my MSP)

Letter dated 27 April 2014

Health concerns in Scotland are ignored because of a sentence, a mere aside in a bracket.

We are told by Angus Council that current Scottish Government guidance states there is NO EVIDENCE of turbine health effects arising from infrasound or low frequency noise generated by the wind turbines that were tested. [1]. This quote is from a bracketed sentence in that link which gives no direct reference to the actual Hayes Mackenzie 2006 report from which it took the information; a report that is EIGHT years old and during which time turbines in Scotland have grown considerably in number, height and capacity.

Reports of ill-health associated with turbines are now prolific around the world.

The Hayes Mackenzie 2006 powerpoint presentation Low Frequency and Infrasound Noise Immission (sic) from Wind Farms and the potential for Vibro-Acoustic disease [2] shows that Infrasound and Low Frequency Noise (ILFN) are emitted by turbines; it states that ILFN can be harmful to humans (known as Vibroacoustic Disease or VAD) and gives a time/symptom chart; it then concludes that it is UNLIKELY that symptoms will result through induced internal body vibration from incident wind farm noise.

This is definitely not the same as the Scottish Government quote above. UNLIKELY is not NO EVIDENCE.

I ask : are measurements independently and continuously taken of ILFN emissions by turbines in Scotland. Are they correlated with reported health effects?

Are we to understand that turbines in Scotland do not affect the local population, yet they do

elsewhere in the world?

This report also states: Dr Mariana Alves-Pereira, in discussion with Dr Amanda Harry in the UK and Dr Nina Pierpont in the US, is now looking into the low- frequency noise and infrasound produced by industrial wind turbines to determine whether they too can cause VAD. Dr Alves-Pereira's initial assessment, based on noise measurements taken inside and outside the homes of wind turbine neighbours, is that turbines are indeed a likely cause of VAD. Dr Pierpont named the effect as Wind Turbine Syndrome (WTS).

With regard to the VAD chart, the report makes a comparison between aircraft technicians, who may experience high levels of ILFN for short periods during their working day, and wind turbine neighbours who experience constant or intermittent and variable ILFN (the tower and/or blades can resonate and emit ILFN even when the blades are not turning). Added to this must be the additional factor for those who live and try to sleep near wind turbines, is that ILFN exposure, which disrupts sleep via repetitive physiological stress and wakening, will do damage to health via sleep deprivation and chronic stress (both of which are well-established in clinical medicine and in the research literature, as harmful).

The report did not produce a WTS chart which would have shown a reduced time of symptom appearance for turbine neighbours. See note 1.

WTS and peer-reviewed reports of the detrimental health effects of turbines have been ignored for up to 20 years, based on an inaccurate quote and an old document that was not directly considering industrial wind turbines.

&#8232;In another 2006 report by Hayes Mackenzie for the DTI, titled Measurement of Low Frequency Noise at Three UK Wind Farms [3] from which the powerpoint presentation is taken, the only conclusions it makes (pages 2, 46 & 66), are based on one sentence from the World Health Organisation (WHO) document Community Noise (para 7.1.4 page 64) dated 1995, which itself is not directly concerning wind turbines. That WHO report is nearly TWENTY years old!!

The recommendations (page 68) do not appear to have been acted upon. Also see note 2.

I urge you to read this very informative article [4].

As I mentioned in my 4 April letter, ILFN causes the body to secrete cortisol which has an immunosuppressive action. A suppressed immune system will allow existing health problems to accelerate and make it easier for new ones to be created.!

I also understand that our bodies try to protect vital organs from ILFN bombardment by laying down extra collagen, causing a thickening of the pericardium and blood vessel walls for instance, which will also increase the likelihood life threatening effects.

ILFN should be added to the list of Silent Killers. Not everyone gets cancer - that doesnt make it any less real.

Scotlands wind energy policy is a slower, but no less effective version of the Highland Clearances of 1746 onwards. Properties are sterilised (Angus Council words) or banned from occupancy (Ark Hill); people are forced to relocate or possibly succumb to WTS and probable early death; and our turbine covered hills and glens are becoming desolate places where few people wish to visit or live.

May I refer you to the Kelley research from the 1980's which proved that wind turbine generated impulsive infrasound and low frequency noise from a single down bladed wind turbine directly



caused annoyance symptoms at levels of sound energy which could not be heard. Also, Professor Salt's research shows some of the neuropsychological pathways involved [5].

Thank you for your continued interest and action. It is greatly appreciated by many thousands of people in Scotland and around the world, who for various reasons are unable to sell their property or relocate and are therefore forced to succumb to the detrimental health effects of WTS as a result of our futile energy policies, inaccurate quotations and outdated documentation.

Note 1. As a rough calculation (without considering sleep deprivation), the time of symptom appearance for WTS should be the VAD time reduced by a factor of around 4.2 (turbine neighbours who live and work near turbines, 24hrs x 7days x 48working weeks = 8064 hrs exposure per yr, assuming 4 weeks holiday away from turbines; technicians, 8hrs x 5days x 48weeks = 1920 hrs exposure per yr. 8064 divided by 1920 = 4.2). Thus a 4yr VAD symptom exposure would manifest in 1yr for a WTS exposure, and a 10 year VAD symptom in 2.5yrs for WTS, which indeed appears to be the case!

Note 2. Similarly, one wonders why ETSU-R-97 (The Assessment and Rating of Noise from Wind Farms) uses 35dBA L90 for all turbine locations when it is commonly accepted that typical daytime background noise levels are around 18 to 20dBA L90 in remote rural areas, 30 to 40dBA L90 in typical or quite suburban areas, and 50 to 60dBA L90 for busy urban areas. Night time levels would be much lower.

[http:// www.scotland.gov.uk/Resource/0044/00440315.pdf](http://www.scotland.gov.uk/Resource/0044/00440315.pdf)

2. <http://www.hayesmckenzie.co.uk/downloads/LF%20and%20Infrasound%20Noise%20Immission%20from%20Wind%20Farms%20and%20the%20Potential%20for%20Vibro%20Acoustic%20Disease%20-%20Malcolm%20D%20Hayes.pdf>

3. <http://www.hayesmckenzie.co.uk/downloads/M Measurement%20of%20Low%20Frequency%20Noise%20at%20Three%20UK%20Wind%20Farms.pdf>

4. <http://blogs.telegraph.co.uk/news/jamesdelingpole/100248760/wind-farm-noise-a-government-cover-up/>

5. <http://waubrafoundation.org.au/2013/explicit-warning-notice/> and <http://www.windturbinesyndrome.com/2014/medical-school-research-team-confirms-wind-turbine-infrasound-can-produce-wind-turbine-syndrome-usa/?var=cna>

Letter dated 8 July 2014

Thank you for your letter of 29 May and for sight of Derek Mackay's letter. He makes the assumption that a moratorium would lead to a resumption of this policy without any changes. I argue that the moratorium could lead to a cessation of this policy, or at least to a resumption with much tighter conditions and health protection which would include Infrasound (ILFN) monitoring.

Whilst the Scottish Government may chose to be unaware of "a peer reviewed, proven, widely experienced dose-response link between wind turbine operation and health impacts", may I refer him to: <http://waubrafoundation.org.au/resources/wind-turbine-noise-adverse-health-effects-june-2014/>.

He makes reference to my "particular situation". I can assure him that there are many people

around Scotland and the world who are suffering similar symptoms as myself but he may not have heard of them because:

they are too ill or already dead

they have not been given access to all relevant information, or have not yet made the connection between their deteriorating health and turbine emissions

if they have made the connection, they are unwilling to make a complaint due to employment, tenancy, property devaluation or other concerns, and indeed maybe their fear of being ridiculed if they have made the connection and voiced concerns and complaints, they have given up due to the manner in which their claims have often been discounted or ignored by the wind industry and government officials (Hansard, 2009, pp.G-516, G-547). Experts contend that the quantity, consistency, and ubiquity of the complaints constitute epidemiological evidence of a strong link between turbine noise, ill health, and disruption of sleep (BMJ2012; 344:e 1527)

As I have mentioned before, I am not complaining about the audible noise from the Ark Hill turbines.

I am seriously complaining about the effects of the infrasound (ILFN) emissions from these turbines - which is not audible. These effects are cumulative, and therefore any visiting officer is unlikely to notice any effects.

The only way for any type of assessment of ILFN is to use good quality ILFN measuring equipment. As you will read in the addendum to my 'Ark Hill - One Year On' (attached), an acoustics expert came here in early April with suitable monitoring equipment and showed a direct time correlation with my being woken and subsequent wakefulness, and infrasound peaks at 3 Hz. A second monitoring box was placed much closer to the turbines and I am confident that the infrasound came from the turbines and not from some other anomaly that has only occurred since the turbines were erected. Please also see my 'Bullet Points' (attached).

The facts are clear:

Wind turbines emit ILFN, and can do so even when the blades are not turning.

ILFN is harmful to humans and other life forms, and can kill.

In the interests of Public Health, the Scottish Government and local Councils should impose a condition on turbine applications that ILFN is measured before and after turbine erection (for a period of a few weeks/months).

ILFN measurement should be a mandatory tool that is used to assess any reported health effects from turbines. This could show a direct time correlation between symptom and ILFN peaks.

I hope this is of interest and that the correct action will be taken to protect public health.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs Angus & Jean Cruickshank

Address: 20 School Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We wish to re-iterate the views we expressed at the open day in 2013.

We were advised that a visit to our home would take place to identify the points we raised - this did not happen.

The points raised were-

The visual impact from our house.

The noise factor levels which cannot be guaranteed.

The concern that more turbines might be erected.

To say that noise levels will be no more than at present is surely questionable, when there will be additional noise from the turbine

A structure at its highest point being more than twice the height of the Bellrock lighthouse should NOT be erected in such close proximity to housing.

We strongly object to such a structure being built.

## **LeslielA**

---

**From:** PLANNING  
**Sent:** 05 February 2015 14:25  
**To:** PLNProcessing  
**Subject:** FW: Planning Application No. 14/0167/Full Bairds Malt Peasiehill Road Arbroath.

**From:** angus roberts  
**Sent:** 05 February 2015 11:57  
**To:** PLANNING  
**Subject:** Planning Application No. 14/0167/Full Bairds Malt Peasiehill Road Arbroath.

With regard to the above Application, i.e. Erection of Wind Turbine, I would offer the following comments; The visual impact of such a turbine on Arbroath's general landscape would be significant and detrimental to the town's landscape setting.

The scale of the proposal would have a serious visual impact on the residential area surrounding the proposed site, it would be entirely out of scale and dominant.

The Company who are proposing this development should be encouraged to re-assess their policy on energy usage by possibly recovering heat from their existing plant and converting that to reduce their overall energy needs.

I support the general concern expressed by the many objections already submitted.

A. Roberts The Stables, Kirkstyle, St. Vigeans, Arbroath, Dd11 4RB

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Brian Ebdon

Address: 19 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register the strongest possible objection to the proposed construction of the wind turbine.

1. Visual intrusion of constantly flashing beacon.
2. It is too close to residential areas.
3. It will be an eyesore for Arbroath which is supposed to be a holiday resort. I would not like to go and stay anywhere for a break near a wind turbine. It would therefore affect tourism to the town.
4. It will create noise and vibrations.
5. It will affect the price of houses in our area.
6. The Arbroath Path Network will be affected as with the local wildlife.
7. The continually moving blades on the turbine will extremely annoying.

I feel that the detrimental affect on the area far out-weighs any benefits that it will bring.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr. Brian Murray

Address: 50 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register the strongest possible objection to the proposed construction of this wind turbine for the following reasons:

The site of the turbine is adjacent to open countryside, would permanently alter the landscape and greatly impair Elliot Nature Trail. The proposed turbine would be visible across the whole of Arbroath.

This could also have a detrimental effect on wildlife in the area. The turbine would pose a serious threat to birds through blade strike.

The turbine would create noise by day and night, to the detriment of local residents, and with possible adverse health implications.

This development will destroy a portion of our Arbroath Path Network.

This development extends the boundaries of the industrial estate and encroaches on agricultural land.

Volume 2 Appendix 2.1 confirms that the proposed development will have a permanent, direct and negative effect on homes in the area. The scale of this proposed development (77 metres) will mean that the actual turbine and blades will not even come close to being screened by existing buildings. This is confirmed by the photomontages in Appendix 2.3. Furthermore, we do not accept that noise levels will be below or on a par with existing background noise from the Maltings. Having experienced the noise generated by similar turbines at close proximity, we have no doubt that the noise generated would be in excess of the current noise levels generated by Bairds

existing industrial development.

Should permission be granted for this wind turbine, within a short period of time further companies could apply for planning permission to erect turbines on their land, therefore increasing noise pollution and increasing the detrimental effect to the Arbroath landscape.

I refer to Ruth Leas of Civitas report dated January 2012 see link below  
<http://www.civitas.org.uk/economy/electricitycosts2012.pdf>

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Maltings Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Christopher Moore

Address: 86 Patrick Allan Fraser street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I have just received a letter from Bairds maltings regarding their plans for a wind turbine. It was made plain from the open days in 2013 that people were horrified at the notion. At 77metres this will blight the local skyline and their claim that noise will be obliterated by the current noise levels is ridiculous , extra noise is what it says, extra noise. Anyone who has been near a turbine will appreciate how noisy they are. As a house owner close to this site I am sure it will adversely affect the value of my property. It is not fair that house holders should suffer for commercial gain. If they wish to do this then build it in the country and run cables to the site but better still do not allow this unthinkable project to go ahead.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Craig Boath

Address: 9 Gerrard Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir/Madam,

I write to object to the proposal of the erection of the wind turbine at Bairds Malt, Arbroath.

My main reasons for opposing are:

The visual impact to the surrounding area.

The noise already created by Baird's Malt is bad enough, however to even consider adding to this is extremely inconsiderate to those residents living in the area.

I would like to add that I am not opposed to wind turbines in general, but feel very strongly about them not being erected in residential areas.

Regards

Craig Boath

Mr David Anderson  
17 Kinghorne St  
Arbroath Angus  
DD11 2LZ

Planning Application for Baird's Malt wind turbine at Elliot industrial  
Estate 14/01067/FULL

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's  
Malt Arbroath, I strongly object to this proposal due to the following  
reasons.

This development will permanently alter and impair the Arbroath  
landscape and reduce our residential amenity.

This development will create additional noise.

This development will produce a flickering effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers, cyclists.

Yours Faithfully

Mr D Anderson



RECEIVED

- 5 FEB 2015

12/12/15

3/2/15



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr David McIntosh

Address: 5 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to object to this application by Bairds malt to erect a wind turbine on the grounds that it will be overly prominent, increase noise and nuisance from rotating blades and flashing lights.

It also causes part of the old Peasiehill track to be diverted.

This may be of benefit to Bairds malt but will have a serious negative effect on the whole of Arbroath.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Denis Crabb

Address: 67 Patrick-Alan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:I OBJECT TO THE WIND TURBINES AT ELLIOT. I FEEL THAT THIS WOULD LOWER THE VALUE OF MY PROPERTY AND WOULD BE UNSIGHTLY AND NOISY AS WE SPEND A LOT OF TIME OUT IN THE GARDEN IN SUMMER.

RECEIVED

AC79

30 PATRICK ALLAN - FRASER ST.

23 JAN 2015

ARBROATH

ANGUS

DD11 2LX

22ND JANUARY 2015

DEAR SIR/MADAM,

IKLW

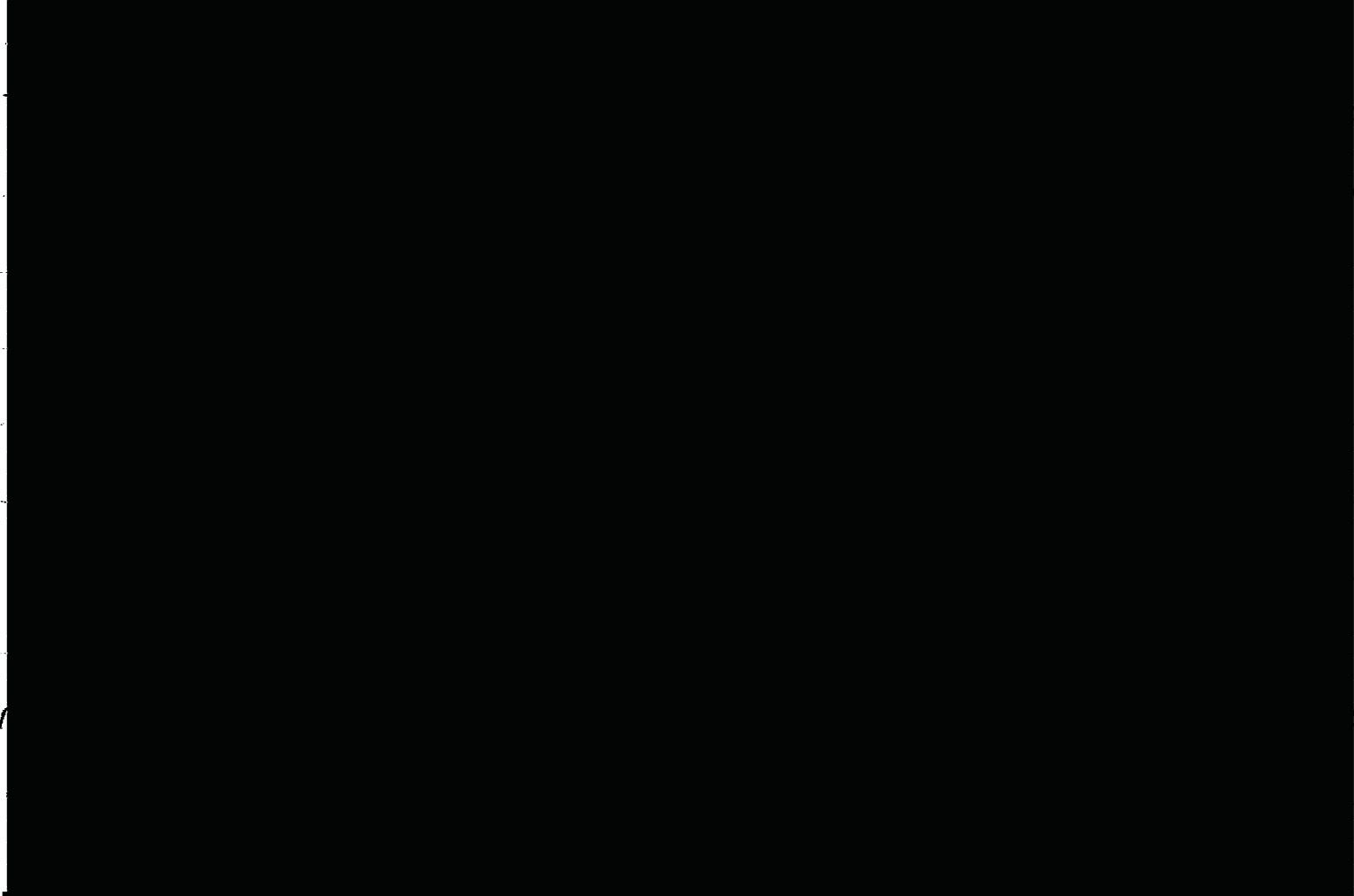
I AM WRITING TO YOU RE-THE APPLICATION OF 'BAIRDS MALTS', ELLIOT INDUSTRIAL ESTATE, ARBROATH FOR THE ERECTION OF A WIND TURBINE. I WISH TO PUT ON RECORD MY OBJECTION TO THE PROPOSAL.

WHILE I AM NOT AGAINST WIND TURBINES PER SE OR THE COMPANY TO FIND WAYS TO CUT PRODUCTION COSTS, I AM DREADING THE QUALITY OF MY LIFE IF THIS APPLICATION IS ALLOWED. MY FEAR IS THE NOISE THAT WILL BE PRODUCED BY SUCH A TURBINE IN SUCH CLOSE PROXIMITY TO DWELLINGS. [REDACTED]

[REDACTED]

[REDACTED]

GET MUCH OPPORTUNITY TO ENJOY THE QUIETER  
SURROUNDINGS HERE.



THAT IS WHY I AM AGAINST A WIND  
TURBINE AT BAIRDS MALTS.



Donald Stewart  
20 Glamis Road  
Arbroath Angus  
DD11 2LY

Bairds Malt wind turbine application Angus Council Planning  
Applications 14/01067/FULL

Dear Sirs,

In common with many of my fellow residents of Hospitalfield and Arbroath I object most strongly to the application by Bairds Malt to erect a wind turbine.

Although this development is on Elliot industrial estate, industry requires people and people require homes and many of the people affected by this proposed development both live and work in the immediate vicinity.

There is currently no other industrial activity in this area that promotes the high levels of noise, dust and odours in the same way that Bairds Malt does, nor has any other company added such a negative visual impact on the surrounding landscape by the erection over the years of multiple additional silos and associated plant.

Now the proposal is to add a noisy and visually intrusive wind turbine, this will be a "wonderfully" negative obelisk to welcome everyone entering our fine old historic town.

Some of the supporting comments mention that there is spare capacity and empty units on the estate and this turbine would create opportunities for additional employment.

It is no surprise that there are empty units close by, because siting a business so close to such a noisy, smelly neighbour would not be conducive to any attractive business opportunity.

Yours Faithfully  
Donald Stewart



28/2/15

RECEIVED

4 - MAR 2015

JL/KW

Mr Douglas Ford  
144 Newton Crescent  
Arbroath  
DD11 3LB

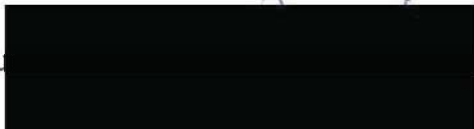
Angus Council Planning Applications 14/01067/FULL Bairds Malt

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's Malt Arbroath, I wish to state that I strongly object to this proposal because of the following reasons.

- 1 The Arbroath landscape will be altered forever.
- 2 There will be additional noise.
- 3 There will be a flickering effect from rotating blades.
- 4 Wild-life will be put at risk.
- 5 Proximity of turbine to Pathway will be dangerous to walkers etc.

Yours Faithful



28-1-2015

RECEIVED

-2 FEB 2015

11/16W

SCANNED

3 - FEB 2015

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Eric Buick

Address: 105 Patrick Allan Fraser St Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:

I object to this proposal due to the following reasons.

- 1 - This development will be a visual intrusion and permanently alter and impair the Arbroath landscape.
- 2 - This development will reduce our residential amenity.
- 3 - This development will create additional irritating noise and vibration.
- 4 - This development will produce an irritating effect by its rotating blades
- 5 - This development will produce further visual intrusion and irritation from a continuously flashing beacon.
- 6 - This development will destroy a portion of our Arbroath Path Network
- 7 - This development could be dangerous to walkers, cyclists and equestrians.
- 8 - This development extends the boundaries of the industrial estate and encroaches on agricultural land.

Yours Faithfully,

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Eric Buick

Address: 105 Patrick Allan Fraser St Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sirs,

As a proud native Arbroathian and a keen supporter of any business interest that will enhance the well being of our community, I find myself along with many others really struggling to find any element of justification for this proposed blight on our local landscape.

This latest submission by the developers regarding the environmental issues connected with it is almost totally undecipherable for the layman. However as far as I can deduce, the EHO suggests that it is an acceptable development, even in view of the fact that our local populace are already subjected to regular onslaughts of noise, dust and odours.

Should the argument be raised that Bairds were there before other neighbouring developments, yes that is partially correct, but nowhere near to the horrendous scale that they have been developed to over the last several years.

This application if accepted would only add to this already extremely unpleasant industrial cocktail.

To sum up, it appears that what the developers are saying is that because folks in the vicinity are already subjected to serious environmental intrusion, not the least of which is visual intrusion - another wee bit won't matter !

Bairds, do the decent thing and withdraw this application now for the benefit of everyone including your company, you'll still survive.



## Comments for Planning Application 14/01067/FULL

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Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Ewan mcIntosh

Address: 17 Duncan Avenue Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:hi i have inserted links to enhance my objections.

Wind farms are a bad way of reducing emissions and a bad way of producing power, said Ben Southwood, head of policy at think tank the Adam Smith Institute.

We may want to reduce carbon emissions, but nuclear and gas are our best ways of doing that until cheap energy storage options are available on a vast scale", he added.

The Conservatives have vowed to end subsidies for new onshore wind farms if they win the 2015 election on the grounds there are already more than enough with planning consent to hit EU green energy targets.

[http://www.cawt.co.uk/uploads/cawt\\_advice.pdf](http://www.cawt.co.uk/uploads/cawt_advice.pdf)

Thousands of turbines are useless in low winds and they are turned off to prevent damage if the speeds are too high.

Families and businesses have paid billions of pounds to subsidise the building of wind farms, both on-shore and off-shore, through their energy bills, sending tariffs soaring.

Living too close to wind turbines can cause heart disease, tinnitus, vertigo, panic attacks, migraines and sleep deprivation, according to groundbreaking research to be published later this year by an American doctor.

Dr Nina Pierpont, a leading New York paediatrician, has been studying the symptoms displayed by

people living near wind turbines in the US, the UK, Italy, Ireland and Canada for more than five years.

there are alot of myths about wind turbines they are only here to hit GREEN energy targets. they are not fit for anything else, in fact they are a hazard to the public and heavily subsidised by the tax payer.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: MR EDWARD SEAWARD

Address: 91 PATRICK ALLAN FRASER STREET ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As with all comments I fully agree, and wish to add my objection to this wind turbine being planted within 500 yards of my back door.

yours

E Seaward

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mister Fred Crowe

Address: 99 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Its ridiculous that the Maltings have again applied to erect a wind turbine . The racket already coming from the site is unbearable and will only get worse. Being outside will be no pleasure during the summer. The view from our garden will be intolerable. No resident in the area will gain anything from the turbine and, as far as I am aware, only the builder, (Kilmac), will benefit from the project. I hope everyone else will agree that this is a definite NO!

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs G & D Cargill

Address: 61 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We strongly object to the planning application for a wind turbine to be erected at Bairds Malt, Elliot Industrial Estate, Arbroath. The reasons include the noise pollution and disturbance this will cause to the area from both low frequency and aerodynamic modulation. The UK Noise Association recommends that wind turbines are not sited within one mile of houses. The close proximity will spoil the comfort and enjoyment of nearby homes and gardens. This structure will also spoil the nearby path network enjoyed by walkers. It is reported there is shadow and/or solar flicker associated with wind turbines and recorded instances of ice fling from blades, wind turbines collapsing, exploding and blades shearing therefore a potential risk to residents, visitors and wildlife. There is some evidence that the health of some people living close to wind turbines deteriorates. It has also been reported that they can affect TV and radio reception and aviation. Although we are in agreement with reducing energy costs, the location is unsuitable in view of the close proximity to homes.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr. Gary Kirkham

Address: 25 Hospitalfield Gardens ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Looking at the drawings and viewpoints, this would have a dramatically adverse effect on the local skyline, as well as provide a noise pollution hazard to those living near the site.

While the company is to be commended on its drive for green energy, there must surely be a way to do so without such a negative impact on the local area.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr&Mrs George&Hazel Rickaby

Address: 93 Patrick Allan Fraser Street, Hospitalfield, ARBROATH Angus.

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:We object to the intended location of the wind turbine, proposed by Baird. Initially it will be too near to a Residential Area. Noise level could have a big impact on people, not appealing to look at from the house. What effect will it have on bird life.

Alarmingly the thought comes to mind, what if allowed, how many Companies in ARBROATH (or nearby) could get the go ahead for a similar situation. Who is going to benefit.....Baird or the towns people?

Mr and Mrs G Rickaby

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr George Harrison

Address: Golf View Elloit Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We would like to strongly object to this Wind Turbine application.

From time to time dependent on wind direction we have to put up with the very unpleasant smell from Bairds Malt facility and now we would have to look at and listen to a Wind Turbine.....No Thanks!

When travelling to Arbroath from the south the first thing you will see is this unsightly Wind Turbine, it may also put off visitors to the caravan park resulting in lost revenue to the town. Residential properties in the vicinity will inevitably drop in value with a substantial amount of families being financially punished for one companies financial gain.



## Comments for Planning Application 14/01067/FULL

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Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: MR GEORGE HUGHES

Address: 52 PATRICK ALLAN FRASER STREET ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:

I OBJECT TO THIS PROPOSAL BECAUSE

1. THE NOISE THE TURBINE WILL CAUSE WILL DISTURB THE SURROUNDING AREA AND COUNTRYSIDE

2. THE TURBINE WILL DOMINATE THE SKYLINE OF ARBROATH

Mr Gordon Chalmers  
16 Kinghorne St  
Arbroath Angus  
DD11 2LZ

30-1-2015

Planning Application for Baird's Malt wind turbine at Elliot industrial  
Estate 14/01067/FULL

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's  
Malt Arbroath, I strongly object to this proposal due to the following  
reasons.

This development will permanently alter and impair the Arbroath  
landscape and reduce our residential amenity.

This development will create additional noise.

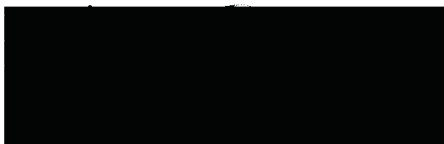
This development will produce a flickering effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers, cyclists.

Yours Faithfully

Gordon Chalmers



RECEIVED

- 2 FEB 2015

IL/KW

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Graeme Cargill

Address: 15 gerrard place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Please accept this comment as my objection to this proposal. The current background noise levels from the factory are more than enough to deal with during peak processing times. A potential 24/7 365 days per year increase in noise levels is totally unacceptable. The noise from these turbines will be detrimental to my health and enjoyment of my property.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Grant Stewart

Address: The hayloft garrison farm Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer made comments in support of the Planning Application

Comment Reasons:

Comment: I believe that the application should be approved, Bairds malt supports lots of local jobs. This wind turbine will greatly bring down the running cost of the operation. The wind turbines were approved at Michelin in Dundee. This site is surrounded by fields, and very high silos. It will give of the impression that Arbroath is moving with the times, while being green.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Ian Fleming

Address: 5 Glamis Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As a concerned Arbroathian and resident of Hospitalfield I wish to object to proposal by Bairds malt to erect a wind turbine on Elliot industrial estate.

We already endure considerable noise, dust and smells from these maltings and now to add a wind turbine it will increase noise and nuisance from the turning rotors, also it will have a severe visual impact at the entrance to Arbroath.

I note that Bairds and their supporters say that this turbine will help them to maintain employment and maybe even expand, does the success of their business depend on one wind turbine?

If Bairds really are interested in the well being of the locality they would note the huge amount of objections they are creating and withdraw their application.

Current tolerance to noise and atmospheric pollution may not continue if they persist with this development.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

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Case Officer: David Gray

### Customer Details

Name: Mr Ian McManus

Address: 3 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I am against this application as the potential noise from the turbine would reduce the value of the property in estate and having passed the Michelin plant turbine, the noise to the resident must be very annoying.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: mr james dear

Address: 77 patrick allan fraser street arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:if wind is more than 25 knots no energy can be produced,propellers must be stoped for SAFETY.

can cause erosion, kills birds destroys wildlife and animal habitats.

can cause - sleep disturbance, ringing in ears, increase heartrate,irritability,problems with concentration, panic episodes.

homes decrease in value and become impossible to sell'

sight polution, noise polution - it is said they will make noise yes there is noise on site but extra noise will increase noise  $1 + 1 = 2$  does it not (double).

they have been known to catch fire and explode spreding debris far and wide,

in winter the blades have been known to throw large pieces of ice hundreds of yards.

recent reports of turbines collapsing.

i feel an enviromental impact assement has to be undertaken

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr James Martin

Address: 9 Seafield Rd Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: i wish to object most strongly to the proposal to erect a wind turbine at Bairds Malt.

Even though this is an industrial estate this enormous structure would have a horribly overwhelming presence and totally dominate all the existing structures and the landscape and skyline at the entrance to our town.

We are trying to make our town better not worse.

This development certainly won't enhance it !



## Comments for Planning Application 14/01067/FULL

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Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Jamie Strachan

Address: 9 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish raise my objection to the wind turbine on the grounds of increased noise levels, visual intrusion and loss of residential amenities.

The noise can be a detriment to the health of residents as well as a detrimental to the local bird population.

It's also a blot on the landscape.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Jim Murray

Address: 40 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the proposed wind turbine at Bairds Maltings. The visual impact this will have on the houses in Patrick Allan Fraser Street and surrounding streets is unacceptable. The noise pollution resulting from these structures is also well documented together with the damage they inflict on wildlife.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr John Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I totally object to the erection of the above wind turbine at Bairds Malt, Elliot Industrial Estate.

I have no doubt that if planning permission is granted, it will not only lower the value of my property considerably, but also lower the residential value of the area as a whole.

It will have a serious negative impact on the landscape for miles around and will obviously be a visual intrusion.

I further believe that agricultural land will be acquired to facilitate this monstrosity and I was under the impression that no more agricultural land in this area would be acquired for development.

I also firmly believe that if planning permission is granted, it will open the floodgates for many more of these unsightly mechanisms.

## Comments for Planning Application 14/01067/FULL

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Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr John Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Further to my original objection, I would further like to comment as follows :-

I have now looked at someone's impression on photographs as to how the area would look with the wind turbine included.

WHO ARE THEY TRYING TO KID ?

These photographs have obviously been registered to give views well in favour of the applicant.

I REPEAT MY OBJECTION THAT THIS WIND TURBINE WOULD BE A BIG BLOT ON THE LANDSCAPE.

## Comments for Planning Application 14/01067/FULL

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Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr John Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I refer to the 7 documents of support this project has had and note that they are all of the same letter heading, same format and same comments. These are all very obviously from the same source.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr John Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

Having just found out that Bairds Maltings (Green Cat) have yet again been granted an extension to their application, I feel that I must seriously object.

This matter has now dragged on for at least 1 year and the local resident's and all other objector's interests would appear to have been set aside in favour of time for the applicant to try and build an acceptable case.

Setting aside any recent assessments or future "grasping at straws" assessments provided by the applicant or their agents, I would have thought that all the initial objections would have been more than enough to stop this project in its tracks, ie., regarding personal, visual and landscape effects to our historic and tourist town.

Now, once again, we have been asked to wait in limbo, not knowing what the future may hold for us.

Yours sincerely.

John Ramsay.

Letter received from Mr John Gillan, 39 Patrick Allan-Fraser Street, Arbroath, DD11 2LX, dated 20 January 2015, reads as follows:-

“I refer to the above planning application and my wife and I wish to strongly oppose such an installation.

The visual impact and noise intrusion will not be acceptable by all residents and poll tax payers residing at Hospitalfield estate and beyond. This may well have an effect on the value of our properties. If this is granted how do you stop applications for other turbines at say Kirkton Estate etc.

Once again we strongly oppose the application.”

Letter 14/01067/FULL (John Gillan)

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr John Harrison

Address: 111 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the erecting of a Turbine at Bairds Malt for the following reasons;

1. Turbines should not be erected adjacent to ANY residential area due to detrimental effect on the community of the area and the landscape. It is bad enough they spoil our shoreline and scenic views in our countryside, but are a distance away from the human population.

2. An increase in health issues due to noise pollution.

3. The detrimental to the local bird population.

4. The reduction in the value of local properties due to the adverse affects of the Turbine. Lets be honest nobody wants to live next to a Wind Turbine 55m to its hub and 77m to tip.

5. I have read and agree with the many objections and comments made by other local residents.

6. I am sure our councillor's (who we voted in) will take notice of the MANY objections when considering the application made by a SINGLE company.

7. I have a grandson who stays in Balunie Street Dundee, approximately HALF A MILE from the 2 x Turbines erected adjacent residential area. He is constantly bombarded with the noise pollution caused by these Turbines. I have also experienced the very unpleasant effects during my visits to his house My property is very close to Bairds Malt.

8. Has Bairds Malt commissioned a study into Solar Panels?

If the answer is YES, can the results be made public along with the reasons why they chosen to persuaded a Turbine?

If answer is NO, then give a reason why, as they certainly have the structures and space to install a sufficient amount of Solar Panels for their requirements.

9. In a letter from Bairds Malt it states "turbine would reduce the electricity consumption by a third; a significant saving for our facility" I foresee, in the future if Bairds Malt wish to increase that saving yet again, they will simply apply for another Turbine to be erected and local population will experience more detrimental effects.



AC103

"Shenaval,"

ELLIOT,

ARBROATH.

DD 11 2PE.

22-1-15.

RECEIVED

23 JAN 2015

14/KL

The Service Manager,  
Planning Dept,  
County Buildings,  
Market St.  
Forfar.  
DD8 3LG.

Ref 14/01064 / Full, Erection of Wind Turbine

Dear Sir,

I wish to express my opposition to the erection of a wind turbine at Bairds Maltings.

Generally, I have no objections to wind turbines, provided they are sited in a suitable location (ie offshore) where they do not create an adverse visual impact or other problems to a community.

Having studied the montages of the proposed site, I am appalled at the size of the turbine and the spoiling of the rural landscape it will cause.

This machine will be seen by every traveller coming into Arbroath from the South and probably other routes, and to many drivers it will be a dangerous

dangerous distraction from their driving.

During military exercises at Barry Buddon concerning R.M. base Condor, there is often an amount of helicopter activity which involves a fair amount of flying over this area, and the erection of this turbine would be an additional hazard to the crew.

I would ask of the directors of Bairds Maltings, of their reactions to having an intrusion into their amenity with such a large mechanical device?

Please give refusal to this project.

Yours faithfully



P.S. I would be more sympathetic to this proposal, if the turbine was to be of some positive benefit to the residents of the Hospitalfield and Elthist, but that is unlikely.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: MR KEITH RAMSAY

Address: 24 ST ANDREWS CRESCENT ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: i object for reasons being, arbroath is a tourist town and they are not attractive to look at, noise pollution, devalue the property in the area of hospitalfield estate.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Keith Swankie

Address: 10 Antiquary Place Forfar

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Would like to object to this - too close to the residential area, would be too noisy.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Ken MacDonald

Address: Bankhead Arbirlot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Please register my objection to the above planning application.

Angus Council and other local bodies have worked hard in recent years to attract visitors and tourists to Arbroath and to encourage them to make use of the local outdoor environment, not least the established Path Network, which will be severely compromised if this development is allowed to go ahead.

Allowing this development to proceed in such close proximity to a residential area would act as a precedent for other turbine applications and could lead to the proliferation of these industrial structures within the Arbroath townscape.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Ker Donald

Address: 33 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: My wife and I strongly oppose the construction of this wind turbine by Bairds Malt. We feel that the height of this construction to be significantly out of proportion to the surrounding area and would be a blot on the landscape not only for Hospitalfield residents but for all the people of Arbroath. Due to the scale of this construction it would not be the most attractive sight for visitors approaching the town.

In addition it concerns us that it may have an impact on property prices in Hospitalfield in the future.

Please lodge our objection to this planning application.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Kevin Barthorpe

Address: 30 Emslaw Drive Timmergreens Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer made comments neither objecting to or supporting the Planning Application

Comment Reasons:

Comment: I am entering this on behalf of Community group Tenants & Residents Uniting Timmergreens & Hospitalfield (TRUTH). After talking to residents in the area I would like to inform you that the group has found the following in regards to the proposed wind turbine at Bairds Malt.

Although there was an overwhelming 70% of those talked to opposed the wind turbine, there was 18% who had no objections either way leaving the other 12% wanting to support the project.

Of the people against the following were some of the reasons as to why they did not want it: the main one was because how people thought it would be unsightly & quite a few cited the 2 at Michelin in Dundee as an example of how it would affect the area. Other issues were noise, property values, damage it could make to wild life too name the main ones.

For those who were in support of the project people were saying how good it would be on the environment for the energy saving potential, it could also give job security for those employed there but also it was suggested that this could also allow Bairds Malt to invest further in the plant bringing much needed investment to the town.

Please note the group has no intention of putting in a view either way but feels that it is only right to give an overall view of those talked to.

Yours

Kevin Barthorpe(Chairperson)

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Kevin Waddell

Address: 23 Horolodge Hill Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I do not believe that 57 employees would be effected. Does this figure include partime and seasonal workers ? I would suspect it does.

I do believe that this project would have a vast negative impact on the community as a whole and certainly effect far more than 57 people, especially those in the immediate surrounding area. I also believe this project would have a disasterous effect on the wildlife environment.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Les Ramage

Address: 17 Dalhousie Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the proposed development of a wind turbine by Bairds Malt and agree with most of the objection comments that have already been submitted.

Whilst agreeing with the need for companies, and individuals to try to reduce their energy usage and obviously for companies to operate profitably, I feel that this solution will be to the general detriment of the Arbroath area as a whole.

Reasons being that it will completely dominate the surrounding skyline in spite of what its supporters state. It will be double the height of existing structures and will be highly visible for miles around.

Having been in close proximity to other turbine installations there will also be an increase in noise.

Would its supporters be happy to live beside the proposed development, I note that none of them live anywhere near the aforementioned areas.

Ask the folks in Hawick Drive area of Dundee (adjacent to the Michelin factory) how they like it.

Of course the next logical conclusion to assume is, that once permission has been granted for a structure of this size, a precedent is then set for another similar application.

In addition I would urge all who support this development to please rethink their stance and consider carefully the proven and now well documented facts about the very negative effects of wind turbines to people and communities, all for the benefit of shareholders and power companies.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Les Scott

Address: 83 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the proposal of a Wind Turbine to be installed at Bairds Malting site. The close proximity to the residential properties of Patrick Allan Fraser Street, of this installation will cause many problems of discomfort from noise pollution generated from the turbine blades, along with the visual impact on the surrounding area is unacceptable.

This installation will also bring a negative effect on the values of property in the Hospitalfield estate.

Please do not allow this planning application to be approved and blight the lives of the local residents.

Malcolm Ross  
89 Kinghorne St  
Arbroath  
DD11 2LZ

Dear Sirs,

Reference the application by Bairds Maltings to install a wind turbine, application reference No. 14/01067/FULL

I wish to object to this on the grounds that it will have an overall detrimental effect to the Hospitalfield/Timmergreens/Westway and Elliot areas.

Its location is far too close to residential and recreational areas also very close to Muirfield School.

It will be extremely obvious from all along the beach, Links and the coastal areas due to its massive height.

I have read extensively the recent reports from all over Scotland about the many serious side effects that wind turbines can have which is caused by the flickering effect also the noise and vibration from the propellers.

Surely a huge international company like Baird's don't really need this turbine and could use their large sheds to install solar panels instead.

I read in the newspapers that the turbine will create jobs, how can that be possible; also it will of course only work when the wind is blowing.

Where will Baird's electricity come from then?

Yours Sincerely  
Malcolm Ross

[Redacted signature area]

RECEIVED

4 - MAR 2015

IL/KW

1/3/15.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: MR Mark Brown

Address: 48 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As residents of a property in Kinghorne Street located in the Hospitalfield estate we are strongly opposed to this application on the grounds that it will have a significant adverse visual and noise pollution impact on nearby residents as well as having a detrimental effect on house values and subsequently the ability to sell residential property in Hospitalfield.

Volume 2 Appendix 2.1 confirms that the proposed development will have a permanent, direct and negative effect on homes in Patrick Allan Fraser Street.

This will without doubt also extend to include the remainder of the Hospitalfield estate, a long established residential area. The scale of this proposed development (77 metres) will mean that the actual turbine and blades will not even come close to being screened by existing buildings.

This is confirmed by the photomontages in Appendix 2.3. Furthermore, we do not accept that noise levels will be below or on a par with existing background noise from the Maltings. Having experienced the noise generated by similar turbines at close proximity, we have no doubt that the noise generated would be in excess of the current noise levels generated by Bairds existing industrial development.

We trust that the planning authority will recognize the impact of such an unwelcome development in close proximity to a long established residential area and refuse this application.

Please lodge our strong objection to this proposal.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Mark Campbell

Address: Seafar Elliot Dundee Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the erection of the wind turbine at Bairds Malt, Peasiehill Road as it will create noise pollution, not only during the day but particularly at night. It will also reduce the value of various properties within the area.

Mr Mark Kubicki  
101 Patrick Allan Fraser St  
Arbroath Angus  
DD11 2LX

RECEIVED

26 JAN 2015

EJKW

22<sup>nd</sup> Jan 2015

Application by Baird's Malt to develop a wind turbine at Elliot industrial Estate  
Ref 14/01067/FULL

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's Malt Arbroath, I wish to state that we strongly object to this proposal due to the following reasons.

This development will permanently alter and impair the landscape.

This development will create additional noise.

This development will produce a shadow flicker effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers, cyclists and equestrian traffic.

This development produces no benefits to residents other than the applicant.

Acceptance of this development would set a precedent for further applications.

  
Yours Faithfully      Mark Kubicki

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Mark Watson

Address: 30 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register my objection to the above application. I am aware of the adverse impact these turbines can have on the surrounding area and community. The noise and visual impact from these turbines will be detrimental to my health and enjoyment of my property as well as the potential impact on the value of my home. I therefore object to this application.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Martin Fox

Address: 103 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I note with concern that the deadline for comments on this application has been increased by 3 weeks. This has resulted in a sudden influx of letters of support. I understand that the majority of these are from Baird malt employees or family / friends of. This is evident from the structure and content of the majority of these 'letters of support'. None of these people live in close proximity to the turbine development so are not directly impacted by the noise and visual pollution of this monstrosity.

I think it disgraceful that the planning department has allowed Baird Malt additional time to orchestrate a support campaign once it became clear that there was overwhelming objection to this proposed development.

Letters of support argue an economic case. However, many residents of Hospitalfield and the surrounding area are long standing residents who have invested time and money in extending and increasing the value of their homes. This has undoubtedly generated considerable work, supported local jobs and provided much needed income for local tradesmen especially during recent tough economic times. I strongly doubt this proposed wind turbine development will encourage people to continue to invest in their homes and consequently support local tradesmen to the degree that they have done in the past.

It would be interesting to know how many Baird Malt employees are local people...from the letters of support it is evident that some are economic migrants and therefore how much of what they earn stays in this country?



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Martin Fox

Address: 103 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Having recently been informed that Bairds Maltings (Green Cat) have yet again been granted another extension to their application, I feel that I must express my disappointment at the planning offices apparent continual pandering to the applicants by allowing them extra time to 'manufacture' evidence in support of their application.

This matter has dragged on for over 1 year. Despite the many valid and forceful representations made by the local community, our genuine concerns are again being set aside in favour of time for the applicant to try and build an 'acceptable' case.

I personally would have thought that all the initial objections would have been more than enough to stop this project in its tracks as the result of an oppressive and dominant visual impact, noise, flicker, loss of amenity etc. I am of the opinion that local residents have tolerated noise and pollution (dust) from the malting for far too long and since the expansion several years ago there has been a marked increase in intrusive noise from the new plant. If this development goes ahead Bairds should rest assured that I for one will no longer tolerate intrusive noise and will start and continue to raise this with the appropriate authorities.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr & Mrs Neil and Evelyn West

Address: 82 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We wish to lodge our strong objections to the erection of wind turbine by Bairds Malt.

A turbine of this size would have an adverse affect on the value of our property and also the ability to sell in future.

The landscape would be blighted and would be able to be seen from many points in the town.

We are certain, despite the assurances by Bairds Malt, that the noise pollution would be greatly increased.

It would also have an detrimental affect on the birdlife in the area.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Neil Milne

Address: 24 Hospitalfield Gardens Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I can only add my voice to the many eloquent statements made here and echo their sentiments. I believe the erection of this wind turbine would have a significant negative impact on the people of Hospitalfield in particular and Arbroath in general. This represents the thin end of the wedge. Such turbines have their place but it is absolutely not suitable so close to a residential area. Angus Council needs to show support for the community by rejecting this application

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Neill Balfour

Address: 40 Hospitalfield Gardens Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir,

I wish to object to this application on the grounds of the adverse effect this will have on the neighbouring residential estate visually and the potential for unacceptable noise on the residential amenity.

I note the Scottish Government Reporter objected to the development of turbines in Montrose on similar grounds in 2013. I can see no difference in this case given the proximity of the residential estates of Hospitalfield.

Yours

Neill Balfour

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Nick Hull

Address: 105 Kinghorne Street arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

As a resident of Hospitalfield Housing Estate I feel obliged to object in the strongest terms regarding this proposed wind turbine. A construction of this size will have a very significant visual impact both in the immediate area and indeed from most vantage points around Arbroath. I am sure it's close proximity to residential property (indeed within a bare minimum to some) will impact on property values. The turbines at Mitchelin in Dundee clearly illustrate what the impact of this application will be. The proposal to re-route the Arbroath Path Network is another feature which was not made apparent at the firm's open day. Having walked in the vicinity of wind turbines of all shapes and sizes they do have a noise impact and will no doubt add to the noise already coming from the maltings. I like many other people are concerned that granting an application so close to residential areas will make it very difficult to refuse other similar companies who wish to reduce their energy costs. The only real beneficiary of this application would appear a significant reduction in their energy bill and no doubt as members of the CCA go some way to achieving an 80% rebate on their Climate Change Levy. All of which I sure will please the Australian owners of the parent company Graincorp but that is little comfort for the residents of Hospitalfield and Arbroath.

**LeslieA**

---

**From:** PLANNING  
**Sent:** 27 January 2015 12:22  
**To:** PLNProcessing  
**Subject:** FW: Objection to wind turbine at Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ 14/01067/FULL

**From:** Norman Anderson  
**Sent:** 27 January 2015 12:13  
**To:** PLANNING  
**Subject:** Objection to wind turbine at Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ 14/01067/FULL

**Application Summary Application Number: 14/01067/FULL**

Address: Baird's Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ  
Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development.

Case Officer: Ed Taylor

**Customer Details**

Norman Anderson  
14 Hospitalfield Rd  
Arbroath  
Angus  
DD112LS

**Re Planning Objection to the above installation.**

I wish to voice my strong objection to the above installation.

We have come to accept the proximity of the current industrial estate as this has been a feature for many years.

We already have air and in some instances noise pollution from the Maltings, which is very much influenced by wind direction but the smell does linger when there is little wind. To increase these problems with visual pollution and possibly more noise pollution is just too much.

If this Turbine is granted permission the visual aspect will not be influenced by nature in any way, it will at all times remain as a blot on the visual landscape. Also there will be a certain amount of noise pollution as the turbines are not silent in operation, and evidence proves blade flicker can cause discomfort in some areas .

Finally I was under the impression that there are height restriction which this clearly exceeds and also the siting is well within the 1 mile of residential dwellings recommendation. Although the area is designated as industrial, the fact that it is in such close proximity to residential areas should be a main factor in the refusal of permission for this wind turbine. I was also under the impression that there was to be no more acquisition of agricultural land for commercial developments.

Norman Anderson  
14 Hospitalfield Rd  
Arbroath

27/01/2015

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs PA & M Burgess

Address: Craigmore Elliot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We, Mr Paul A Burgess and Mrs Margaret Burgess, would like to lodge our objection to the proposed Erection of a Wind Turbine by Bairds Malt, Peasiehill Road, Arbroath.

We feel that the erection of this turbine would cause us great difficulty in enjoying the peace and quiet in our garden during the Summer months. We have lived in the area for just over a year and moved here because of the views (front and back) and the 'countryside' setting - NOT to live on an industrial estate! It will cause extra noise in the area, which, at times, is only bearable. With road/train noise to the front of our house it would not be acceptable to impose any extra noise to the back than already exists. The view from our garden would be severely impacted by the erection of this wind turbine, we believe this would have a detrimental effect on the value of our property.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Peter Taylor

Address: 21 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the proposed erection of a wind turbine on the above site.

- 1 The visual impact to surrounding properties would not only be an eyesore, but would have a serious effect on their future saleability.
2. Such a structure would only create a precedent for further similar projects within the surrounding area.
3. While guarantees that there would be no additional noise pollution are given, we are all aware that this is not the case, Michelin Dundee being an example.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Peter Topham

Address: 47, Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the proposed wind turbine on the following grounds:

#### 1. Visual / Landscape Impact:

If consented, a single turbine with a height of 55m to hub and 77m to blade tip would clearly dominate Arbroath's coastal landscape. Although located in a designated urban area, it would have a significant impact on the wider coastal landscape (TAY14a). Ironside Farrar (2014) has very clear and detailed guidelines regarding this matter. In conclusion, after carefully considering the plans, I do not accept that the claimed partial screening of the existing buildings would be sufficient to reduce the turbine's visual impact on the wider coastal landscape to acceptable levels.

#### 2. Noise:

A report by Cox and Unwin (2013) details many scientific concerns regarding the outdated and inadequate application of the ETSU-R-97 noise assessment guidelines. It describes one of the most important noise characteristics of wind turbines, ignored by ETSU-R-97, to be virtually identical to the 'blade slap' of a helicopter rotor blade. As a resident of the Hospitalfield estate, I have occasionally experienced military helicopters flying overhead. My direct experience of this is that the noise from the helicopter can be heard and the accompanying vibrations felt inside my home. I tolerate the helicopter noise, because the helicopter passes infrequently and quickly. However, the equivalent noise characteristics emanating from the proposed \*permanent\* wind turbine would be an intolerable \*permanent\* source of annoyance for years to come. In conclusion, due to the inadequacies of ETSU-R-97, I cannot accept Baird Malt's claim that there will be no additional noise.

## References

- Ironside Farrar (2014). Strategic Landscape Capacity Assessment for Wind Energy in Angus, 70-72
- Cox, Richard. and Unwin, David. (2013). 'Bad science' behind the wind turbine noise guidelines

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Raymond Hunter Meldrum

Address: "Kyrenia" 73 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register my objection to the above application. I am well aware of the adverse impact of these turbines can have on the surrounding area and communities. The noise and visual impact are only two of many detrimental issues that can emanate from these turbines. I therefore strongly object to this application.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs Robert & Linda Strachan

Address: 9 Kinhorne Street Hospitalfield Arroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We are residents of the Hospitalfield Residential Estate and wish to submit our very strong objection to the proposed erection of a wind turbine at the above site.

- 1- The visual impact would be detrimental to both the estate and the surrounding areas.
- 2- It will affect the saleability of properties in the surrounding area.
- 3- Although there are guarantees that there would be no additional noise pollution this would not be the case as anyone who has been in close proximity to one of these structures will know.
- 4- Wind turbines in close proximity to residential areas can cause an increase in health issues.
- 5- It would be detrimental to the local bird population.
- 6- If permission is given for the erection of this wind turbine it would create a precedent for similar projects in the surrounding area.

WE STRONGLY OBJECT TO THIS PROPOSAL.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr & Mrs Robert and Suzanne Cargill

Address: Burnside Elliot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: We wish to lodge our objection to this project. Along with the other local residents we are concerned about the detrimental impact that this turbine will have on both the environment we live in, our property values and on our businesses. Our specific comments are:

Appendix 2.2 Residential Assessment : Our property at Burnside, Elliot has been completely missed from this assessment which we find most concerning when all other surrounding properties have been considered. This raises the question over how accurate the submission as a whole is. We keep horses at the property. We are concerned that the impact of the turbine, which will be visible and audible in their grazing area, has not been considered.

Equestrian Access to track adjacent to Wind Turbine: The track adjacent to the turbine is the only quiet off road that we can use to gives us access to quieter country roads for hacking. Without this track we either have to ride along the cycle path adjacent to the dual carriageway or ride along the Westway within the town boundary to access suitable hacking routes. Both of these alternative routes can be very busy with traffic which means they are not always a safe alternative. We note that the track will be diverted but it is unclear whether its equestrian use has been properly considered.

Business concerns: We have two businesses on site which may also be affected.

Elliot Caravan Park is a long established business provided holiday accommodation; we are concerned that a visible and audible wind turbine will discourage not only our current customers but new customers. Regardless of the practical impact of the turbine, its perception by potential new customers may be enough to discourage them considering using the park for their holidays. Elliot Mews Cattery is a very new business which is trying hard to build its customer base. We are promoting a quiet countryside location but this may be difficult to sell to new customers close to a large turbine.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Roger Peart

Address: Kelly Cottage Arbirlot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:Re the planning application for a wind turbine at the Maltings. The structure is far to big,and in the wrong place.

Noise levels for the nearest houses will be intolerable. I lived for a week close to a stucture of this size in the Hebrides. No sleep was had by anybody. I would suggest a Turbine of smaller size at least one mile away from property,on farmland possibly. This way a farmer could be plugged in as well,or indeed the housing estate close by.

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

08 APR 2015

MLKJ

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: RONALD KEITH

Address: NETHER BIRNIE

BENHOLM BY MONTROSE

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Scott Ramsay

Address: Kirkstyle House Kirkstyle, St Vigean's Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to this application on the grounds of the noise generated by the turbine, the environmental impact to the surrounding countryside & the devaluation of the surrounding properties.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Maltings Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Shane Bibby

Address: 13 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

Whilst I reside a street over from the proposed location of this 77 Mtr Wind Turbine I find it ridiculous that this is even being considered adjacent to a residential housing estate.

Today we received a letter stating that Baird Malts following their consultation with the people of the estate were going ahead with their application for this Wind Turbine which is over 3/4 the length of a football pitch height.

I am aware that at their consultation meeting with the people of the local estate they were left in no doubt at total objection local people would make.

Bairds Malt state in their letter that there would be no additional noise as the noise will be covered by the Maltings Noise. This is rubbish as any noise will be additional to the present noise and if anyone has been close to one of these 77 Mtr Wind Turbines they will know for themselves the noise created.

If they wish to build such a wind turbine then they should reconsider and build if at least a kilometre or two away on farmland and run cables to the site, this would show due consideration to neighbouring residential homes.

I also believe this 77 Mtr High Wind Turbine will have a serious detrimental effect on property values of all the Hospitalfield Estate.

I am aware that Glaxo had a similar wind turbine turned down at the entrance of Montrose Harbour which was even further away from residential homes than this proposal.

Please lodge my objection to this 77 Mtr Wind Turbine proposal.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Shane Bibby

Address: 13 Kinghorne Street Arbroath Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Having checked again what is happening regarding the application for a 77Mtr Industrial Wind Turbine.

I see with utter dismay this application is still ongoing.

This is despite nearly all the local people directly effected in the Hospitalfield Housing Estate being against it, with well in excess of a hundred individual objections being submitted.

This 77 Mtr Turbine (height over 3/4 the length of a football pitch or 17 mtrs higher than the Scott memorial, if approved will be an absolute eyesore on the edge of a housing estate and at the gateway to Arbroath.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Shane Bibby

Address: 13 King Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

In addition to my previous objection, I respectfully request that the following points from a previous local application for a different wind turbine are also considered before granting any permission to build.

In August 2013, the United Nations Economic Commission Europe (UNECE) declared that the UK Governments National Renewable Energy Action Plan (NREAP) violates the laws that transpose The Aarhus Convention into the UK legal framework, in that it is not abiding by Article 7 of the Convention. In particular the public have not been given full access to information on the established unacceptable negative impacts on people and the environment, nor have the public been given decision-making powers over their approval.

For this reason alone there should be an immediate moratorium on all wind turbine applications and decisions.

Also, a recent ruling by Lady Clark of Calton has deemed that unless applicants have the relevant OFGEM licence (or DECC exemption), their application is incompetent (unlawful), and planning consent should not be given.

Lady Clark argues that this applies to almost all turbines.

Wind turbine applications often state that the turbine(s) are required for farming diversification. This is obviously incorrect. What it is, is an industrialisation and sterilisation of huge areas of land and sea. When two or more turbines are gathered together, it should be called a wind factory. Firstly, wind turbines are certainly not life forms, and therefore it can not be a farm nor farming. And secondly, there is no conclusive evidence that they sustain human life, or the lives of any other life form (except perhaps a few carrion feeders until they are killed by the impact of a blade or suffer internal haemorrhaging and death).

In fact the opposite is probably true.

For example, there is mounting evidence that the end result of wind turbine manufacture and use is an increase in CO2 emissions. Furthermore, there is mounting evidence that wind turbine use is harmful to humans, livestock, and other life forms.

In the last 12 months approximately 100 million birds and bats were killed world wide by wind turbines. It is estimated that 90% of the bats drown in their own blood when their lung capillaries rupture as a result of the pressure changes near turning blades. Only around 10% of bats are killed by the impact of a blade.

The Elliot area around where this application is planned is a recognised winter feeding area for 1,000s of Geese, this year the numbers have increased and it is a wonderful spectacle for everyone in the area. I can see the potential death of large numbers of Geese due to the Turbines planned location in a winter feeding area.

(Small turbines are also lethal to bats and birds as they are usually sited near buildings that provide roosting and nesting sites.)

There is also growing concern over the stress, internal haemorrhaging, birth defects and still births, of livestock and pets that are kept near wind turbines. These same harmful effects are no doubt occurring to our wild life, and other life forms.

Humans are reported to suffer depression, dizziness and insomnia and I am sure that internal haemorrhaging, birth defects and still births will follow as the years go by.

I understand that in recent years there has been an acknowledged and unexplained increase in cases of insomnia, dizziness and headaches in Dundee. There have been two large wind turbines operating in Dundee since 2006.

The harm is caused by emissions of both ground hugging Infrasound, and Low Frequency Noise. These are accumulative (ie. the longer the exposure, the worse the symptoms), have a range of around 10km, and are mostly at vibrations below the human hearing range. The use of sound (including Infrasound) is a known military interrogation aid and weapon.

From my own observations, hares, which live and breed on open ground, would appear to be one of the first terrestrial animals to succumb to this internal haemorrhaging and death out to a distance of at least 5km.

With regard to the effect of off-shore wind factories on marine life, we can be sure that it is considerable. Water is an excellent conductor of sound vibrations, and fish have the ability to detect minute pressure changes (0.5%), and in some cases down to less than 1mb (millibar). Standard atmospheric pressure at sea level is about 1,013 mb.

Also, I fail to see how the quarrying and transport of huge quantities of granite and other stone in order to stabilise offshore turbines, can possibly reduce CO2 emissions, recently, the cities of Kolding and Sønderborg in Denmark decided to not erect further wind turbines (in their 500 km<sup>2</sup>+ jurisdictions) until the uncertainty about the health impacts on Neighbours is settled.

Mr Mauri Johansson (Specialist in Community and Occupational Medicine) recently stated that: "During the last 12 months, several smaller municipalities had done the same, in spite of strong pressure from government. They are not satisfied with the noise regulations, and demand that genuinely independent studies be done concerning the effects of wind turbines on health.

Last year, retired Danish High Court judge Peter Roerdam stated that wind power is an industry

which has thoroughly corrupted the political system Further, Mr Mauri Johansson has this year added that: It is clear the institutional political corruption and the lack of professional ethics on the part of wind industry acousticians and public health researchers, who ignore or deny the existence of the sleep and health problems and the consequent serious long term damage to health, is not limited to Denmark.

Indeed, in 1987 a report, led by N.D.Kelley from the Solar Energy Research Institute in Colorado, found impulsive infrasound caused health problems. This report has been ignored for 25 years. Wind electricity is one of the most expensive forms of electricity to be produced. Each turn of a blade adds to our electricity charges. This is as a result of their abysmal efficiencies. It has been calculated that the average turbine only produces between 15 - 28% of its rated capacity over a year, and the kilowatts of electricity produced per square kilometre, or cubic kilometre, of a wind factory is equally abysmal.

The way these huge costs (Renewables Obligation [RO], Feed In Tariffs [FIT], extra pylon and Infrastructure construction, and other `upgrades`) are arbitrarily added to our electricity bills, and the profits kept by a select few, is worse than the illegal chain letter scam.

I say worse because one has to actually opt in to be scammed by a chain letter. This is not the case with wind energy. However, it would be a simple matter to contact all electricity users and ask them if they wish to pay for wind electricity - and if so, could they tick the opt in to be scammed` box. The cost of wind electricity could then be proportioned fairly between those willing and able to pay for it.

Even small turbines increase our electricity prices, since turbines up to 6KW can be very easily connected to the grid to export electricity and receive an income (through FITs for example).

I understand that thousands of diesel generators are being prepared all over Britain to provide emergency back-up when wind power fails - in order to prevent the National Grid collapsing.

Under this hugely costly scheme, the National Grid is set to pay up to 12 times the normal wholesale market rate for the electricity they generate. Currently the wholesale price for electricity is around £50 per megawatt hour (MWh) but diesel-generator owners will be paid £600 per MWh. These generator owners will also be paid enormous sums for just having them available to be switched on. Any suggestions that:

1. Because there are already turbines or pylons in the area, then it is somehow OK to compound the problem with these turbines is ludicrous! You do not solve a problem by creating an even Bigger problem.
2. Because there is already a commercial business in the area and therefore it is somehow OK to Compound the problem with these turbines is similarly ludicrous. Why enhance an eye sore with an even larger eye sore?
3. If we have to have wind factories, then this is as good a place as any to have one is again Ludicrous. We are meant to be living in a democracy and nobody should have to have anything; Particularly when it is against the wish of the majority of the population. There are probably now as Many, if not more, opinion polls against wind turbines as there are for them. One thing is certain Though, those against are growing rapidly as more and more people realise the true nature and Cost, both financially and environmentally, of wind turbines, be they individual or factory units.
4. The county has somehow missed out on tens of millions of pounds worth of investment money

by

The rejection of several wind factory applications is, once again, ludicrous. Very little of that supposed investment would ever benefit the county, as is proven time and again, where the local Business to gain the most is probably the fencing contractor!

5. Communities would somehow gain from the so-called Community Fund, or community bribe as More and more people are calling it, is .ludicrous - although there is an argument that this is Merely another disingenuous misleading spin. The value of the bribe is often only equivalent to The concessions and exemptions a landowner receives for having a wind factory on his land, and Therefore the net gain to local county and therefore community is probably zero.

6. Jobs would be increased by this application is misleading, if not ludicrous. The majority of the Workforce in the construction, erection and maintenance of turbines comes from abroad, and if the American example is anything to go by, any UK jobs come at a cost of \$12m per job. There is Also the valid argument that they are not green jobs anyway, since they cause harm to humans and the environment, and raise CO2 emissions.

7. It is somehow OK to empty properties and effectively sterilise huge areas of the Scotland so that wind factories can be built is outrageous and is reminiscent of the Highland Clearances. We have Much to be proud of in our history with our determination to fight for, and support, freedom and Democracy. This renewable energy policy is certainly not something to be proud of.

8. There is a silent majority in favour of wind turbines - that harm their neighbours and cause great Financial hardship through the exorbitant increases to our electricity bills, is yet again, ludicrous. The silent majority are silent because they have not been told about the harm (to humans, environmentally and financially) that wind turbines and wind factories cause. This comment is Supported by the UNEC decision mentioned above.

Any arrangement which pays millions of pounds to wind factories to NOT produce electricity when The wind is blowing, is beyond belief. If this was applied to every business, I dread to think where The money would come from to pay for all the surplus production and services.

Should Scotland gain its independence, one wonders if the electricity users of the rest of Great Britain will continue to be prepared to pay the exorbitant price for Scottish wind power, even if it is Later sold back to them at a ridiculously reduced price. If not, and if these costs are placed solely On Scottish electricity users, it will cause great hardship, financial difficulty, fuel poverty and Bankruptcy to many people and businesses in Scotland, and Scotland will swiftly follow in the Footsteps of countries like Spain and others who have fallen for the wind power scam. (Spain is a Particularly cautionary tale. By failing to control the cost of guaranteed subsidies, Spanish Electricity users have been saddled with 126bn of obligations to renewable-energy developers.) In theory would take about 1,500 wind turbines of around 100m tall spread over 20km<sup>2</sup> to Produce the same electricity as a 1,000 megawatt (1GW) power station even then the wind farm Could not provide a steady supply. Wind varies considerably, and thus the power station is still Required or maybe we need to cover over 100sq km with turbines to possibly provide something Near the power from one power station.

Another way of looking at it: if we are to achieve this energy policy, nearly 40% of rural Scotland Will be covered with wind turbines (or more accurately, 40% of rural Scotland will be within 2km of



A turbine).

In Denmark there are over 6000 turbines for 5.4m people, yet wind power only counts for less than 19% of their electricity requirements, has not resulted in the closure of any power stations, and They have one of the highest electricity prices in Europe.

Germany has the most expensive electricity in Europe and it is estimated that up to 800,000 German households have had their power cut off because they couldnt pay the countrys rising electricity bills.

In the UK there are around 5 million households that are struggling to pay their ever rising electricity bills (mainly as a result of these wind factories).

It has been forecast that by 2017, the rapidly rising UK electricity prices will be almost double German prices.

German CO2 emissions have been rising for two years in a row as coal is experiencing a renaissance, and they are building 20 new coal-fired power stations to provide power when there is no wind or sun usually in the winter when the power is most needed.

CO2 emissions in the EU as a whole are likely to rise because of increased coal burning at power stations.

The import of vast amounts of wood, from countries such as America, to power biomass power Stations cannot possibly be good for the environment or help reduce CO2 emissions, and no Doubt will cause further unnecessary price increases for our electricity.

There are very few good wind turbines. By good I mean ones which comply with a few simple, Common-sense criteria such as:

- a) Where the electricity produced helps to supplement the power requirements of the landowner Without taking money from every other electricity user in the country to do so;
- b) Where they do not cause continuous harm to humans and other life forms;
- c) Where the CO2 emissions caused by the construction, erection and maintenance of the turbines is accurately assessed and the result (either increased or decreased), is justified;
- d) Where the loss of revenue to other local businesses caused by the location of the turbines is justified.

If one applies just these few criteria to wind factories, then there are no good wind factories, either Onshore or offshore (the financial cost and CO2 emissions caused by offshore factories are Considerably greater than onshore factories), and very few good turbines.

If we are to have renewable energy providers for our national requirements, then we should be Considering systems that guarantee to provide a steady supply of power at more than 30% efficiency, do no harm, and help save the environment. Wind power can never achieve this.

On a more personal level, we run a holiday cottage business, and many of our visitors have stated That, with regret, they will not return if Angus over-run with turbines. This will greatly affect our Livelihood and many other businesses in the area which rely on tourism. I am sure this growing Dislike and rejection of turbines applies to other areas of the country.

I urge you not to allow the country to be invaded by these turbines.

Let common-sense prevail, reject this application, and help save the country for future generations.

I would like at this stage to add that:

1. The Scottish Natural Heritage (SNH) wind farm map for August 2013

<http://www.snh.gov.uk/docs/A1055080.pdf> is disgracefully and inherently inaccurate. It has no definition of what it is mapping (ie, what SNH consider a wind farm), and should not be used for any analysis, or indeed any other purpose.

SNH state that we seek to map all developments of more than 1 turbine but we aren't consulted on all of these, so the map is a subset of the applications actually within the system. So, a single turbine over 100m high, or even a cluster of single turbines might not be shown even if SNH had been consulted! It is therefore a totally useless map as most Councils will verify by a quick comparison with their own maps and/or Renewables Datasheets.

If SNH use information such as this for their consultations, it suggests that their consultations and Recommendations are of little value.

2. Paragraphs 4.15 to 4.21 of: <http://www.scotland.gov.uk/Publications/2009/07/03153034/7> states That there is a minimum notification of 21 days for individuals to make representations.

This is a totally inadequate timescale to allow the public to raise suitable site/application specific representations. Most of us are in full time employment with busy family schedules, and it is Difficult to find the time to:

- a. find out about turbine applications in the area - especially when the applicants only notify the Minimum possible, and often not even the household(s) that is highlighted as being most affected according to their own proposal documentation.
- b. find, read and understand the application documentation.
- c. find, read and understand any planning legislation or regulations for wind turbines.
- d. prepare and submit a suitable site specific representation.

It also does not allow for incidents when people may be away on holiday, or for work or health reasons.

3. Similarly, the 20m boundary notification is totally inadequate since:

- a. a turbine could be built that could potentially topple onto a neighbouring property.
- b. neighbouring property could be at risk of ice or turbine blade throw.
- c. it does not allow for neighbour notification regarding the very real health risks to humans out to at least 2 km.
- d. it does not allow for neighbour notification regarding the known negative effects on property prices.
- e. it does not allow for neighbour notification regarding the known negative effects on local tourist and other businesses.

A much more responsible solution for Councils would surely be to adopt a minimum of 3 to 4 months deadline for representations, and a direct notification (by post, not newspaper) of all `Owner, Lessee or Occupier` at the address of the neighbouring land within a minimum of 2 to 3 km. This would at least bring us more in line with the UNECE decision quoted at the beginning of this objection.

One hopes that Councils and Councillors are actively suggesting something along these lines to Scottish Government



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Shane Bibby

Address: 13 Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I refer to my previous objections.

I have read most objection and support letters and I feel that with regard to letters submitted by Hospitalfield Estate residents

100% of the letters submitted were objections from residents all offering their own individual objections. There appear no letters of support from Hospitalfield Estate.

With regard to the letters of support most are clearly the result of campaign where the same letter is being copied and pasted or handed out for people to sign in an effort to boost numbers. Most letters of support are being submitted from Dundee, Forfar, Carnoustie, Kirriemuir and Montrose with a few from Arbroath.

## Comments for Planning Application 14/01067/FULL

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Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Shane Bibby

Address: 13 Kinghorne Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

I note with dismay that despite all the objections , in excess of 100 individual objectors mostly from the Hospitalfield Estate which is directly adjacent to the proposed 77 mtr wind turbine, and official opinions opposing this Turbine. Yet again Green Cat renewables have obtained another extension until end of August 2016 regarding noise issues.

I respectfully request that when considering the proposal, that Green Cats Ark Hill Turbine noise issues be taken into account. If this 77 mtr Turbine is allowed to be built and the noise issues are as with those at Ark Hill then removal of the Wind Turbine would be a far larger issue than refusing planning permission in the first place...especially with all the issues and objections already made.

Regards Shane Bibby

109, Patrick Allan Fraser Street,  
ARBROATH,

Angus.

DD11 2LX

14<sup>th</sup> January 2015

RECEIVED  
16 JAN 2015  
K/RW

Application by Bairds Malt Ltd to develop wind turbine at Elliot Industrial Estate

Dear Sir/Madam,

With reference to the above application to erect a wind turbine at Bairds Malt Arbroath, we wish to state that we strongly object to this proposal, due to the following reasons.

- We feel the visual aspect of this structure will have a detrimental effect on the future value and selling potential of our property.
- There is no guarantee that noise levels will **not** be increased as stated by Bairds Malt in the letter to us. (8<sup>th</sup> January 2015)
- There is no guarantee that further wind turbines might be erected on Elliot Industrial Estate should this proposal be passed.

Furthermore we wish to state that we are original owners of the property adjacent to the Bairds Malt Complex, and we have had extremely good relations with the Management of this company over virtually 35years, regarding noise pollution.

Yours faithfully,



Stefan Wujec



Anne Wujec

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Steven Carnegie

Address: 56 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to record my objection to the proposed erection of a wind turbine at Bairds Malt.

This turbine would be very obvious due to its massive height on the approach to Arbroath from Dundee, the beech/links and coastal areas and the Water Tower to name but a few focal points.

From where I live I can hear the noise already emitting from the Maltings. This increases when production is at its height during the busy times. I have heard for myself when out on the hills the noise emitting from such structures and fear that the noise levels around where I live will increase even more.

Having read various reports available on wind turbines I am also concerned for the health of myself and others along with the birds and wildlife abounding in the area.

Although I am not considering a move at present I think house prices in the Hospitalfield area will become significantly lower if this goes ahead.

I also think that if granted this may set a precedent for the possibility of another if required by Bairds Malt or indeed another employer in the area.

Turbines are only operational when the wind is blowing but if too windy operations cease as is the case when too much electricity is generated for the National Grid. This means that the turbine could be out of commission for a great deal of the time so how would this help the employer cut costs.

# AC134

I am all for cutting costs and for securing jobs but think there should be consideration given to alternative means. What about the erection of low level solar panels for instance?

After looking at the comments of those in favour I note the mass majority do not live in the town or the effected area so this would not have such an impact on them as those residing here.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr Steven Low

Address: 2 Bank Farm Steading Arbirlot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I'm in the middle of building my dream home at bank farm.

I have a south facing balcony with unspoiled views. I simply DO NOT want any turbines turning and distracting my picturesque view.

If we let one to be erected, then how many others will pop up.

NO!

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mr Steven Reid

Address: 11 Grrahamston Terrace Arbirlot Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:

Given the visual representations of the proposed turbine that are available it appears that this development will have a very large detrimental visual impact on the whole of Arbroath and a significant area around it.

Would it not be preferable for the community that the company looks to install a smaller turbine, or turbines mounted on the existing buildings, with less visual impact, and a solar PV array, also on the existing buildings, offering diversification of generation sources and greater control of available power generation to the company for whatever purposes it requires this for.

The current proposal seems ill prepared, poorly thought out and, I believe, against the local development plan.

AC137

Walmac Cottage  
Elliot,  
Arbroath  
DD11 2PE.  
20-1-15

Application by Baird's Malt to develop wind turbine at Elliot industrial Estate

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's Malt Arbroath, we wish to state that we strongly object to this proposal due to the following reasons.

This development will permanently alter and impair the landscape.

This development will create additional noise.

This development will produce a shadow flicker effect from rotating blades.

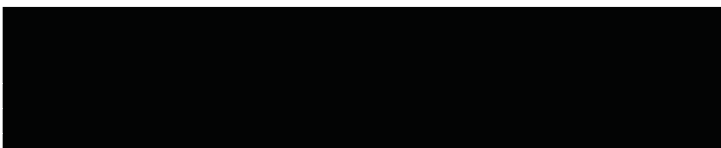
This development could be harmful to wild life.

This development could be dangerous to walkers cyclists and equestrian traffic.

This development produces no benefits to residents other than the applicant.

Acceptance of this development would set a precedent for further applications.

Yours Faithfully.



RECEIVED

22 JAN 2015

12/11/15



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr William Bennett

Address: 18 Antiquary Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: This wind turbine will be obtrusive, noisy, a blight on the horizon and will devalue properties.

This is too high a cost to bear for those affected .

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: mr william cumming

Address: 6 hospitalfield road arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dont want wind turbines in our area

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr William Ramsay

Address: 35 Harbour Road Tayport

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:As a former resident of Arbroath I object to the erection of this turbine as I believe it will be a blot on the landscape of what is a beautiful area.

It will also have a negative effect on the attraction of visitors to Arbroath wishing to use the facilities of the two caravan parks in close proximity.

Mrs P. V. Payne AC141  
14 GERRARD ROAD,  
ARRAOTH - ANGLS  
AD 11 2LL

2nd February 2015

RECEIVED

- 5 FEB 2015

12/14W

Dear Sirs

APPLICATION 14/01067 FROM LORAMON OF WIND TURBINES

I wish to object to the erection of a Wind Turbine on the Elliot Industrial Estate.

I have lived near a Wind Turbine before I moved to Scotland beside the constant noise the impact usually on a Housing area is very ugly to the occupants residents and it does devalue the property nearby, My Husband and I bought the house because of the area, and knew that the Industrial Estate was already there but had no visual impact on the Housing area.

Yours faithfully



Letter from Mrs Alison Ouchterlony, 99 Kinghorne Street, Arbroath, DD11 2LZ, received 30 January 2015, reads as follows:-

“I wish to lodge my objection to this proposal, mainly due to the adverse effect it would have on the value of properties in the surrounding area, also to the adverse visual impact on the landscape, to say nothing of the noise intrusion. Another major concern is the strong possibility of more springing up should this one get the go-ahead.

I do hope you will take all these viewpoints into consideration, and look forward to the outcome being against the proposal.”

Letter 14/01067/FULL (Alison Ouchterlony)

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Anne Caird

Address: 40 School Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Due to the close proximity of the proposed wind turbine to the Hospitalfield housing estate I would like to object to the proposed plan.

Mrs Charlotte Anderson  
17 Kinghorne St  
Arbroath Angus  
DD11 2LZ

Planning Application for Baird's Malt wind turbine at Elliot industrial  
Estate 14/01067/FULL

Dear Sir/Madam

With reference to the above application to erect a wind turbine at Baird's  
Malt Arbroath, I strongly object to this proposal due to the following  
reasons.

This development will permanently alter and impair the Arbroath  
landscape and reduce our residential amenity.

This development will create additional noise.

This development will produce a flickering effect from rotating blades.

This development could be harmful to wild life.

This development could be dangerous to walkers, cyclists.

RECEIVED

- 5 FEB 2015

12/12/15

Yours Faithfully

Mrs C Anderson



3/2/15

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Emma Buick

Address: 105 Patrick Allan Fraser St Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to this proposal due to the following reasons.

- 1 - This development will be a visual intrusion and permanently alter and impair the Arbroath landscape.
- 2 - This development will reduce our residential amenity.
- 3 - This development will create additional irritating noise and vibration.
- 4 - This development will produce an irritating effect by its rotating blades
- 5 - This development will produce further visual intrusion and irritation from a continuously flashing beacon.
- 6 - This development will destroy a portion of our Arbroath Path Network
- 7 - This development could be dangerous to walkers, cyclists and equestrians.
- 8 - This development extends the boundaries of the industrial estate and encroaches on agricultural land.
- 9 - This development could be harmful to wild life.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Gail Ebdon

Address: 19 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register the strongest possible objection to the proposed construction of the wind turbine.

1. Visual intrusion of constantly flashing beacon.
2. It is too close to residential areas.
3. It will be an eyesore for Arbroath which is supposed to be a holiday resort. I would not like to go and stay anywhere for a break near a wind turbine. It would therefore affect tourism to the town.
4. It will create noise and vibrations.
5. It will affect the price of houses in our area.
6. The Arbroath Path Network will be affected as will the local wildlife. There are numerous geese and starlings that are abundant in the area not to mention other birds and animals.
7. The continually moving blades on the turbine will extremely annoying.

I feel that the detrimental affect on the area far out-weighs any benefits that it will bring.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Gail Murray

Address: 50 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register the strongest possible objection to the proposed construction of this wind turbine for the following reasons:

The site of the turbine is adjacent to open countryside, would permanently alter the landscape and greatly impair Elliot Nature Trail. The proposed turbine would be visible across the whole of Arbroath.

This could also have a detrimental effect on wildlife in the area. The turbine would pose a serious threat to birds through blade strike.

The turbine would create noise by day and night, to the detriment of local residents, and with possible adverse health implications.

This development will destroy a portion of our Arbroath Path Network.

This development extends the boundaries of the industrial estate and encroaches on agricultural land.

Volume 2 Appendix 2.1 confirms that the proposed development will have a permanent, direct and negative effect on homes in the area. The scale of this proposed development (77 metres) will mean that the actual turbine and blades will not even come close to being screened by existing buildings. This is confirmed by the photomontages in Appendix 2.3. Furthermore, we do not accept that noise levels will be below or on a par with existing background noise from the Maltings. Having experienced the noise generated by similar turbines at close proximity, we have no doubt

that the noise generated would be in excess of the current noise levels generated by Bairds existing industrial development.

Should permission be granted for this wind turbine, within a short period of time further companies could apply for planning permission to erect turbines on their land, therefore increasing noise pollution and increasing the detrimental effect to the Arbroath landscape.

I refer to Ruth Leas of Civitas report dated January 2012 see link below  
<http://www.civitas.org.uk/economy/electricitycosts2012.pdf>

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Gwen Ramage

Address: 17 Dalhousie Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the proposed development of a wind turbine by Bairds Malt and agree with most of the objection comments that have already been submitted.

Whilst agreeing with the need for companies, and individuals to try to reduce their energy usage and obviously for companies to operate profitably, I feel that this solution will be to the general detriment of the Arbroath area as a whole.

Reasons being that it will completely dominate the surrounding skyline in spite of what its supporters state. It will be double the height of existing structures and will be highly visible for miles around.

Having been in close proximity to other turbine installations there will also be an increase in noise.

Would its supporters be happy to live beside the proposed development, I note that none of them live anywhere near the aforementioned areas.

Ask the folks in Hawick Drive area of Dundee (adjacent to the Michelin factory) how they like it.

Of course the next logical conclusion to assume is, that once permission has been granted for a structure of this size, a precedent is then set for another similar application.

**LeslieA**

---

**From:** DownieKM on behalf of PLANNING  
**Sent:** 27 January 2015 12:57  
**To:** PLNProcessing  
**Subject:** FW: Objection to wind turbine at Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ 14/01067/FULL .

**From:** Norman Anderson  
**Sent:** 27 January 2015 12:21  
**To:** PLANNING  
**Subject:** Objection to wind turbine at Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ 14/01067/FULL .

**Application Summary Application Number: 14/01067/FULL**

Address: Baird's Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ  
Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development.

Case Officer: Ed Taylor

**Customer Details**

Norman Anderson  
14 Hospitalfield Rd  
Arbroath  
Angus  
DD112LS

**Re Planning Objection to the above installation.**

I wish to voice my strong objection to the above installation.

We have come to accept the proximity of the current industrial estate as this has been a feature for many years.

We already have air and in some instances noise pollution from the Maltings, which is very much influenced by wind direction but the smell does linger when there is little wind. To increase these problems with visual pollution and possibly more noise pollution is just too much.

If this Turbine is granted permission the visual aspect will not be influenced by nature in any way, it will at all times remain as a blot on the visual landscape. Also there will be a certain amount of noise pollution as the turbines are not silent in operation, and evidence proves blade flicker can cause discomfort in some areas .

Finally I was under the impression that there are height restriction which this clearly exceeds and also the siting is well within the 1 mile of residential dwellings recommendation. Although the area is designated as industrial, the fact that it is in such close proximity to residential areas should be a main factor in the refusal of permission for this wind turbine. I was also under the impression that there was to be no more acquisition of agricultural land for commercial developments.

Helen Anderson  
14 Hospitalfield Rd  
Arbroath  
.

27/01/2015

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Isobel Waddell

Address: 14 Abbot Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to this project on the grounds that it will have a big visual impact on the area. Also, I am an animal lover and believe it will have a detrimental impact on the wildlife in the area. It will also be environmentally negative for a lot of people who take leisure walks with their dogs. I am positive that pets and children would be terrified to go anywhere near this noisy monstrosity.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Jacqueline Swankie

Address: 10 Antiquary Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Strongly object to this proposal - visual & noise impact

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr James Leslie

Address: 51 Patrick Allan-Fraser Street ARBROATH

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I feel it would be an eyesore from my back garden.

Because of its size it would overpower the size of the houses in the area which are mainly bungalows.

It would lower the value of the houses in the estate.

I feel that the noise and vibration emitting from the proposed wind turbine could be detrimental to the health of people living in the area.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Jane Ann Meldrum

Address: "Kyrenia" 73 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to object to this planning application. The visual impact along with the noise factor will be detrimental to my health and standard of living. I am well aware of the impact these turbines have caused to the environments where they have already been allowed to proliferate.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mrs Janis Hughes

Address: 52 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to register the strongest possible objection to the proposed construction of this wind turbine for the following reasons:

Visual impact:

The proposed site of the turbine is adjacent to open countryside which is widely enjoyed as an amenity for local residents as well as visitors and tourists. The construction of this turbine will completely and permanently alter this landscape and greatly impair the peace and enjoyment of Elliot Nature Trail.

The proposed turbine would be visible across almost the whole of Arbroath.

Noise:

The turbine would create noise by day and night, to the detriment of local residents, and with possible adverse health implications.

Threat to wildlife:

Geese from Montrose Basin fly down to feed in the fields on either side of the A92 west of Arbroath. There are also starlings in the area as well as heron and buzzards. The turbine would pose a serious threat to all these birds through blade strike. The flight of the geese and the murmurations of the starlings are features of Arbroath and greatly valued by local residents.

Health and Safety:

Wind turbines are dangerous. The most common cause of accidents is blade failure. Blades can

travel significant distances if they fail.

The distance of the proposed turbine to paths, roads, caravans and housing presents an unacceptable safety risk to walkers, cyclists, horse riders and residents.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Linda, Ann Ramsay

Address: Kirkstyle House Kirkstyle, St Vigean's Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to this application as it will permanently alter the skyline & surrounding landscape.

It will be damaging to wildlife in the area.

The noise generated by the turbine will be a disruption to the surrounding area.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Linda Pyott

Address: 14 School Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Please lodge my total objection to this very large Wind Turbine adjacent to the Hospitalfield Housing Estate.

I find it inconceivable that this is even being considered so close to residential house.

I feel it will detract from image of Arbroath when entering the town from the Dundee direction , just like the sorry state of affairs when people approach Dundee.

I would also object on the grounds of noise, light flicker, danger to wildlife in that this is a winter roosting area for thousands of geese and the locality next to a public footpath.

I feel that Baird Malts have already exceeded their remit in the size of their development , noise and air pollution.

I do not want to see such a monstrosity near my home every day....this is a residential estate.

I note none of the letters of support are from the Hospitalfield residents but are mostly from Dundee, Carnoustie and Forfar with the odd one or two from other parts of Arbroath not affected by this very Large Wind Turbine.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Linda Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object strongly to this, what can only be described as an unsightly, unwanted intrusion into our lives.

I object on the grounds that it will be a visual intrusion which will be seen from great distances.

I have grandchildren who will surely be frightened at the size and noise of such an eyesore and may even give them nightmares. Has anyone looked at the medical implications of the introduction of such a monstrosity ?

I can see no benefit to anyone in the community and in fact, I can see it having a big negative impact.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Linda Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear Sir

I refer to the front page article in the Courier and Advertiser when serious points were made about the medical effects of wind turbines on people's health, and in particular the noise factor and hearing damage.

I would like to augment my objections to the building of this wind turbine a) on the grounds as mentioned above, b) the effect the noise would have on my grandchildren who frequently visit and stay with us.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Linda Ramsay

Address: 97 Patrick Alan Fraser Street Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I cannot believe that the application for this project is still on-going. Why have there now been 2 extensions to the deadline for submissions been granted to Bairds Malt. Surely our elected councillors can see by the high number of individual objectors and the small number of orchestrated supporters that this application should be stopped now.

By the facts that are available, it is not difficult to see that these monstrosities are inefficient and can only be funded by massive subsidies and costs to consumers and taxpayers. What happens when there is no wind or too much wind, we will still require other methods of producing energy.

This is over and above objections already made in regards to being a visual intrusion, environmentally unfriendly with regards to wildlife, and, not least, any medical effects it may have which to date do not seem to have been properly addressed.



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Lynn Carnegie

Address: 56 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I would like to register my objection to the proposed erection of a wind turbine at Baird's Malt.

Although I live a street over from the Maltings, I can clearly hear the noise presently produced by its production. This is increased greatly over the summer months when the production is increased. I have heard for myself the noise a turbine of this size makes and fear noise levels will be significantly increased.

Having read various reports I am also concerned about the risk to health for myself and others along with the birds and wildlife in the area.

Although I am not considering moving at present I do feel that if this turbine is granted it would significantly lower the value of properties within the Hospitalfield estate. If one employer is granted then another may follow suit.

I am all for cutting costs and for ensuring jobs but think an alternative method such as low level solar panels should be considered by Bairds Malt.

Mrs M Lumgair

22, Hospitalfield road,

ARBROATH.

DD11 2LS

27/01/15

RECEIVED

30 JAN 2015

ILRW

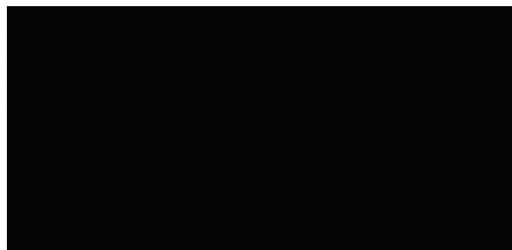
Dear sir, I wish to protest most virulently in respect of the purposed "wind Turbine" which Bairds Malt Ltd are hoping to erect in the vicinity of their premises.

Being that to accommodate this eye sore they have to buy adjacent Land and also interfere with the "Arbroath Path Network", which I use myself in the spring and summer. Therefore I think this would be the thin edge of the wedge for the lovely rural vistas and the ethos of this pretty walk that one can enjoy without being out of sight of the town.

I also have a personnel objection to this monstrosity that if it goes ahead it will be in full view from my lounge window in Hospitalfield road. As it is I already have to look at their last planning application being these giant silos that Are very apparent from my home. I also want to state that the "humming noise" emitted from these silo's is audible when everything quiets down and I am aware of this noise when I lie in bed as it is a low rumbling sort of noise. Also they use what I assume are Gull scaring bangs both mornings and evenings that are very off-putting. Now they are asking us the home owners to accept more noise pollution from a giant 77metre wind turbine!!! Well I say NO definitely not.!

When I bought this house newly built being the first and only owner everything which existed on the Elliot industrial site was LOW-Level, in other words they did not impact on this residential estate.

If you allow this application to go ahead it will devalue every property on this estate to which I seriously object. If this application is passed, I for one would expect my council tax to be considerably reduced as I would be living in part of the 77metre wind turbine monstrosity. IT IS DISGUSTING HOW IT WILL IMPACT ON THOSE WHO HAVE TO LIVE IN VIEW OF IT. I SAY A VERY LOUD NO!



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Margaret Christison

Address: 5 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to object to this application by Bairds malt to erect a wind turbine on the grounds that it will be overly prominent, increase noise and nuisance from rotating blades and flashing lights.

It also causes part of the old Peasiehill track to be diverted.

This may be of benefit to Bairds Malt but will have a serious negative effect on the whole of Arbroath.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Margaret Leslie

Address: 51 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the erection of the proposed wind turbine by Bairds Malt.

It would be detrimental to the environment and would affect the wildlife living in the surrounding area.

It would be an eyesore and would be seen from my back garden. How could we sit outside on a nice day to relax with a huge turbine bearing down on us?

The noise and vibration from the turbine would be detrimental to the health of those living near it.

It would lower the value of the domestic properties situated near it and make properties difficult to sell.

There are more environmentally friendly ways of providing "green energy", solar energy would be a better option.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Margaret Ramsay

Address: 35 Harbour Road Tayport

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I believe there to be a considerable noise emitted by these turbines which cannot be good for the health of close residents.

This will also have a negative effect on the property values on the area.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Margaret simpson

Address: 113 Patrick Allan Fraser st t01241876535 Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Here we are with yet another extension to this never ending saga Baird's should come to their senses and withdraw this application and find another way to save their fuel expenditure this has gone on long enough now give the hospitalfield and Elliot residents an early Christmas present and throw it out

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Marion Bibby

Address: 13 Kinghorne Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Please lodge my objection to this proposed 77 metres Wind Turbine adjacent to the Hospitalfield Housing Estate.

I do not feel this will fit in with the local area especially if approaching Arbroath from Dundee it will be an eyesore at the entrance of Arbroath as in the case of The approach to Dundee.

I also note that there has been an extension for submissions which to me looks like it has been purely extended to allow a burst of support submissions mostly from people in Carnoustie and Dundee with a few from other parts of Arbroath not visually affected by this 77 Mtr Turbine.

I also note that there are no letters of support from any residents of Hospitalfield Housing Estate. It appears all supporters are of the nimby (not in my backyard) variety.

Please lodge my objection on the grounds of Noise, Visual impact, Health , Danger to wild life and its proximity to a local public footpath , I do not want to look out everyday at a 77 Mtr wind Turbine from my living room

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: Mrs Muriel Blake

Address: 85 Patrick Allan Fraser street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to this turbine due to the impact it will have both on the look and the noise it will cause. The maltings are very close to the street (less than 400m)? Already they cause disruption with noise and the view from the street. This turbine will be much taller and noisier than anything that is already constructed. In the words of the applicant " the development would lead to a high magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.". If they think this how can the council even consider this application so close to a residential area. This can only have an adverse effect on this area of the town. I know no one wants this in their backyard but in this case it will be in our backyard and an eyesore throughout out the town. I would urge the planning committee to refuse this application due to the long term effect it will have on this area of the town



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Nancy Christie

Address: Hospitalfield Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the proposed wind turbine at Bairds Malt.

I am a Hospitalfield resident and am very concerned about the following:

1. Increased noise levels.
2. Spoiled appearance of landscape from many areas.
3. Possible increased health risks to nearby residents.
4. Flicker effect.
5. Reduction of property values.
6. Harmful effect to birds and animals.
7. To allow the erection of one wind turbine might lead to many other companies wishing to do the same thing.

I appreciate that every business has to be run cost effectively but surely the cost saving for Bairds Malt is not worth the cost which will have to be paid by local residents and the community as a whole?

Letter received from Mrs Nancy McCluskey, 30 Patrick Allan-Fraser street, Arbroath, DD11 2LX, dated 24 January 2015, reads as follows:-

“I wish to strongly object to this proposal as it would have a detrimental effect to the landscape of this area plus added noise intrusion. I do know that this could have problems health wise as well. I am in my seventies and have hearing problems so the noise would be of no benefit to me. I do spend a lot of time gardening which I enjoy very much and I do think it could affect my hearing quite a lot. Hope that you take this into consideration.”

Letter 14/01067/FULL (Nancy McCluskey)

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Nora Stewart

Address: 54 Newbigging Drive Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Having just heard about this project, I strongly object on the grounds that it will be very detrimental to the landscape for miles around.

This will have a negative impact on the value of Arbroath as a whole, not least as a holiday town which includes the Abbey, caravan sites and the links.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: David Gray

### Customer Details

Name: mrs norah dear

Address: 77 patrick allan fraser street arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: i wish to object on following grounds,

winds of more than 25 knots, turbines must stop for SAFETY no energy can be produced.

causes erosion, destroys animal habitats kills birds,

may cause - sleep disturbance, ringing in ears, increase heart rate, irritability, concentration problems, panic episodes .

will be unsightly, disturb our love of outdoors, unknown health risks

homes value decrease and difficult to sell.

sight pollution, noise pollution.

there have been incidents of fire and exploding debris.

it has been known in winter large pieces of ice to be scattered hundreds of yards.

we do not want another seed crusher disaster on our hands and hope Angus Council learned a lesson from that.

i request an environmental impact assessment should be carried out first of all

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Norma Bennett

Address: 18 Antiquary Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I object to the disturbance this will cause in the vicinity and the fact that it will be seen from our windows.

It will also adversely affect the value of my property.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Patricia Scott

Address: 83 Patrick Allan Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I dislike the thought of seeing a massive wind turbine towering up in the air every time I look out of the window, and when I am out in the garden.

Too many of these are being allowed to be built and destroying the views of the countryside

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Ruth Boath

Address: 9 Gerrard Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strenuously object to the proposal of the erection of the wind turbine so close to the residential area of Hospitalfield. We already have noise and smell emitting from the Baird Maltings without the additional noise which will come from a wind turbine. I am also very much concerned about the potential health hazards as a result of living so close to a wind turbine for my family and myself. Ruth Boath

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Sandra Waddell

Address: 23 Horolodge Hill Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: Dear sir, I have only now become aware of this application and I would strenuously object to the erection of this object.

It will have an enormous visual effect on the countryside and the approach to this lovely town. I would also be concerned that if this monstrosity was allowed to go ahead, it would open the floodgates for many more, possibly in other areas of the town.

No ! No ! No !



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Sharon Spink

Address: 78 Patrick Allan-Fraser Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I would like to add my objection to the many others. I have no problems with wind turbines in the appropriate location, but I feel this one is too close to my home and would have an adverse affect on the value of my property. Who wants to look out their living room window at one ? Not me ! Which would be the case if this went ahead. I also have concerns about the level of noise it may create.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Val Adam

Address: 60 Kinghone Street Arbroath

### Comment Details

Commenter Type: Miscellaneous

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I wish to make my objection to the erection of the wind turbine by Bairds Malt, Elliot Industrial Estate, Arbroath. I am objecting on the grounds of the visual impact which may effect the value of house in Hospitalfield, also there may be increased noise from the turbine which will impact everyone living close by, there is also an issue with the flicker effect on residents close by

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mrs Wilma Ewart

Address: Airlie 19 Gerrard Place Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I Wish to object to the Baird Malt Wind Turbine planning application. This is a residential area first and foremost .I am not apposed to alternate energy use but to put a turbine on our doorstep could set the community up for further developments in the future.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Ms Avril Hobbs

Address: 66 Patrick Allan Fraster Street Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I STRONGLY OBJECT TO THE ERECTION OF A WIND TURBINE ON THE SITE AT ELLIOT. THIS WILL BE IN THE LINE OF VISION FROM MY LIVING ROOM WINDOW, I FEEL THAT SEEING, HEARING AND SMELLING THE MALTINGS FROM MY HOME IS BAD ENOUGH WITHOUT THE ADDED EYESORE OF A WIND TURBINE. I HAVE PAID GOOD MONEY TO LIVE IN MY HOUSE AND FEEL THAT THE VALUE WILL BE GREATLY UNDERMINED BY HAVING THIS UGLY, AND POTENTIALLY USELESS PIECE OF MACHINERY SITUATED NEXT TO A RESIDENTIAL AREA.

## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Ms Susan Ettershank

Address: 3 Hospitalfield Road Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment: I strongly object to the proposed wind turbine.

While I am generally in favour of conserving energy, I believe this turbine would have a detrimental impact on the environment and that the disadvantages would outweigh any advantages. Such a massive structure would be unsightly and despite claims to the contrary, would inevitably be noisy. This would very likely lead to a reduction in value of house prices in the area. For these reasons, turbines should not be built in any residential area, therefore I object to this proposal.

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: 

Address: Mollesnash, By Brechin,

Angus, DD9 6TH

RECEIVED

11 MAR 2015

12/12/15

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 5/2/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: NEIL CHAPMAN

Address: 16 LOCHLANDS DRIVE

ARBROATH

RECEIVED

12 FEB 2015

IL/KW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date: 04 February 2015

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

  
MR NEIL MOFFAT

10A CHURCH STREET, ARBROATH, ANGUS, DD11 1JL

RECEIVED

- 6 FEB 2015

IC/KW



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
12/11/15  
12/11/15

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: NICOLA CLARK

Address: 59 BROOK STREET

MONIFIETH, ANGUS

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
IKU

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: NORMA MCINTOSH,

Address: 24 KIRKTON PLACE,

ARBROATH. DD114HX

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

RECEIVED

27 FEB 2015

IL/KW

Dear Mr Taylor,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely



Print Name - ROBERT DONNELLY

Address: 2A GLENAGNES RD

---

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,



Print Name: ROBERT WEBSTER

Address: 13 BLOOMFIELD GARDENS.

ARBROATH

RECEIVED

12 FEB 2015

IL/KW

Mr David Gray  
Planning Officer (Development Standard)  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

12 FEB 2015

14K2

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,



Print Name - ROSS MCKENZIE

Address: 182 RAVENSBY ROAD

CARNOUSTIE

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

[Redacted Signature]

Address: FLAT 1, OLD SAILORS HOME,  
62 DOCK ST, DUNDEE, DDI 3DU

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

13 FEB 2015

ILKW

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,



Print Name: SARAH SELLARS

Address: 30 BLOOMFIELD GARDENS

ARBRATH, DD11 3LJ

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

12 FEB 2015

HKW

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
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- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: STUART GALL

Address: 42 BLOOMFIELD

ROAD ARBROATH



Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

13 FEB 2015

14KL

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: SHIRLEY HOFFMAN

Address: 2 MOROCYE HILL

ARBROATH

Susan Ross  
89 Kinghorne St  
Arbroath  
DD11 2LZ

Dear Sirs,

Reference the application by Bairds Maltings to install a wind turbine, application reference No. 14/01067/FULL

I wish to object to this on the grounds that it will have an overall detrimental effect to the Hospitalfield/Timmergreens/Westway and Elliot areas.

Its location is far too close to residential and recreational areas also very close to Muirfield School.

It will be extremely obvious from all along the beach, Links and the coastal areas due to its massive height.

I have read extensively the recent reports from all over Scotland about the many serious side effects that wind turbines can have which is caused by the flickering effect also the noise and vibration from the propellers.

Surely a huge international company like Baird's don't really need this turbine and could use their large sheds to install solar panels instead.

I read in the newspapers that the turbine will create jobs, how can that be possible; also it will of course only work when the wind is blowing.

Where will Baird's electricity come from then?

Yours Sincerely  
Susan Ross



RECEIVED

4 - MAR 2015

IL/KLW

1/3/15

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,

Print Name: T. Hamman

Address: 7 Balmashanner Place,  
Forfar Angus DD8 1PE

RECEIVED

9 - MAR 2015

IL/KW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED  
13 FEB 2015  
RJKU

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

As an Angus resident, I have reviewed the planning application and find that the economic benefits of the scheme outweigh any future potential visual impacts, recognising the turbine has been positioned at the South East Corner of the industrial facility.

- The Bairds Malt Turbine proposal will produce 100% on-site use of the electricity as this is a very energy intensive business.
- The project will safeguard existing and future jobs on the facility which was originally opened in Arbroath in 1970 and has been a source of local employment (now circa 57 employees) for over 40 years.
- In my opinion the Bairds Malt Turbine proposal will not significantly reduce the amenity value of the area.
- I have looked at the photomontages of the wind turbines and I find their appearance within the existing industrial landscape acceptable which gives support to the socio economic reasons supporting the project.
- Excellent opportunity for local contractors and suppliers to benefit from the project

Yours Sincerely,

Print Name: TOM MCINTOSH,

Address: 24 KIRKTON PLACE,

ARBROATH. DD114 HX.

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

Dear Mr Taylor,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,



Print Name: VALERIE GAIL MORRISON

Address: 8A DALHOUSIE ROAD

B/FERRY DUNDEE DD5 2SQ

FILED

24 FEB 2015

14/KW

Mr David Gray  
Planning Officer (Development Standard)  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

Yours Sincerely,



Print Name - VAN BOECKEL FRANK

Address: GIR 43 SCOTTS STREET

DD 2 2 AP

RECEIVED

12 FEB 2015

12/KW

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

13 FEB 2015

IL/KW

Date: 10/2/15

Application Ref: 14/01067/FULL

Dear Mr Gray,

Following review of the above planning application I would like to register my support and encourage Angus Council to make a balanced assessment and consent the project as it will :-

- Protect jobs
- Support other local suppliers to Bairds Malt
- Allow the business to strengthen / expand.
- Other plots on the industrial estate are disused and empty – important to retain Bairds.
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.
- Located in an industrial area and surrounded by the Malting's plant
- ES shows that noise from the turbine is not a problem.

Please consider the above principal points when making your recommendation on the project.

Yours Sincerely,

Print Name: DEBORAH MURRAY

Address: 44 SHERIFF STEIN PLACE

ARROWATH DD11 5JY

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

12 FEB 2015

IKLJ

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Sincerely,



Print Name: EDWARD FARRELL

Address: 12, BROADHANDS

CARNOUSTIE ANGUS DD7 6JY



## Comments for Planning Application 14/01067/FULL

### Application Summary

Application Number: 14/01067/FULL

Address: Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ

Proposal: Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development

Case Officer: Ed Taylor

### Customer Details

Name: Mr John Bird

Address: 5 Hospitalfield gardens Arbroath

### Comment Details

Commenter Type: Member of Public

Stance: Customer objects to the Planning Application

Comment Reasons:

Comment:1 The constant 24 hour noise that is generated by the turbine.

2 The impact on the nature trail of such an imposing structure on people walking along this popular route.

Mr David Gray  
Planning Officer  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
DD8 3LG  
Angus

RECEIVED

17 FEB 2015  
IL/KL

Date:

Application Ref: 14/01067/FULL

Dear Mr Gray,

I am writing to express my unequivocal support for the Bairds Malt single wind turbine application. It is such an important scheme for local business and it is vital that it goes ahead so as to safeguard existing and future jobs on the Arbroath Facility. In its Industrial setting I strongly believe that:

- The single turbine will not in any way detract from its surroundings and will not in any sense impact on my enjoyment of the greater area.
- It is a suitable distance from residential properties, a noise assessment within the ES has shown that residential amenity would be protected
- It is outside of protected landscape areas such as Areas of Outstanding Natural Beauty and National Parks and the Angus Glens!
- On-site use of electricity for an energy intensive business - a good use of renewable energy directly in line with government policy.

Yours Since



Print Name: Michael Burns

Address: 2 Pitliverie FARM Cottage .

CARNOUSTIE DD7 6LU

Mr Ed Taylor  
Senior Planner  
Angus Council Planning Department  
County Buildings  
Market Street  
Forfar  
Angus  
DD8 3LG

Date:

Application Ref: 14/01067/FULL

RECEIVED

27 FEB 2015

IL/KW

Dear Mr Taylor,

I would like to register my support for the Bairds Malt single turbine. I believe that the project contains many preferable characteristics for a development of this type, including:

- The wind turbine is not located within any ecologically designated areas.
- The project will safeguard existing jobs.
- Excellent opportunity for local contractors and suppliers to benefit from the project.
- The potential to support new local employment and encourage further capital investment in the malting.

On the basis of the points above and the fact that it will support an employer that is important to the town/region I would urge the Council to approve the application.

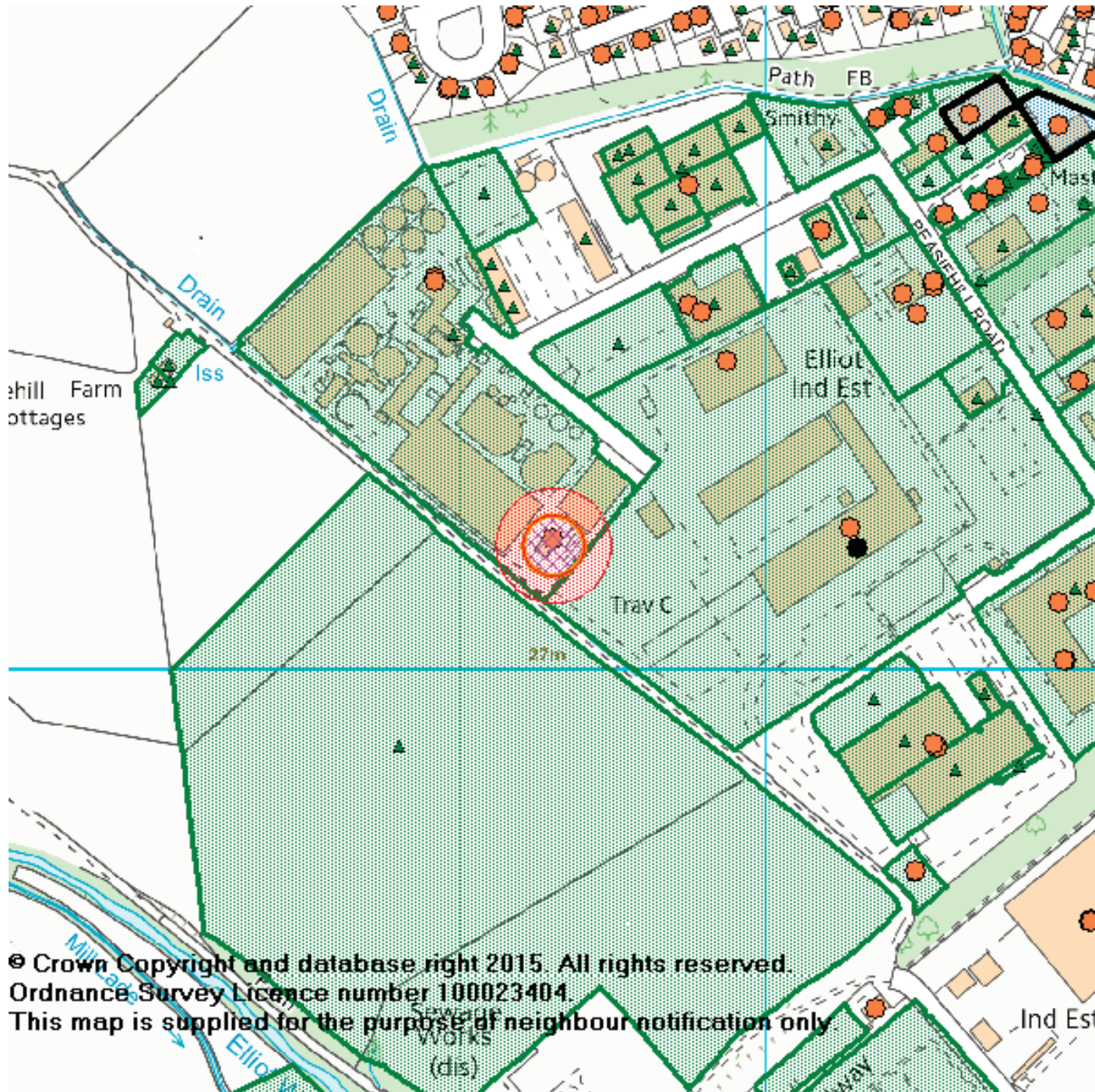
Yours Sincerely,

Print Name - SEAN ZIEINSKI

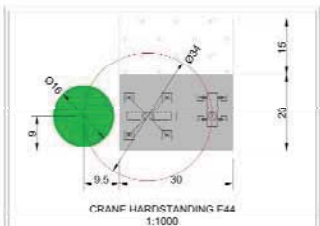
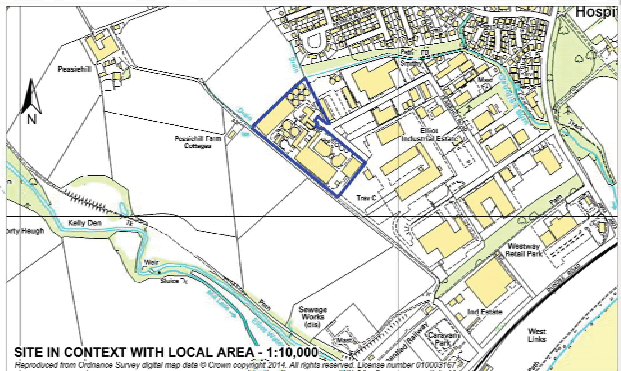
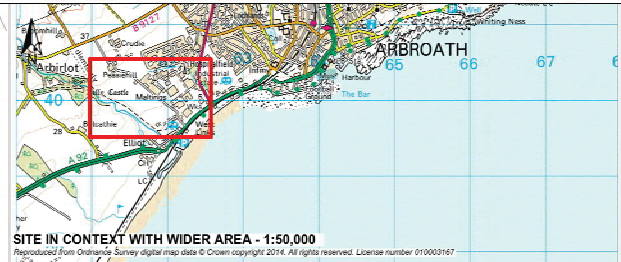
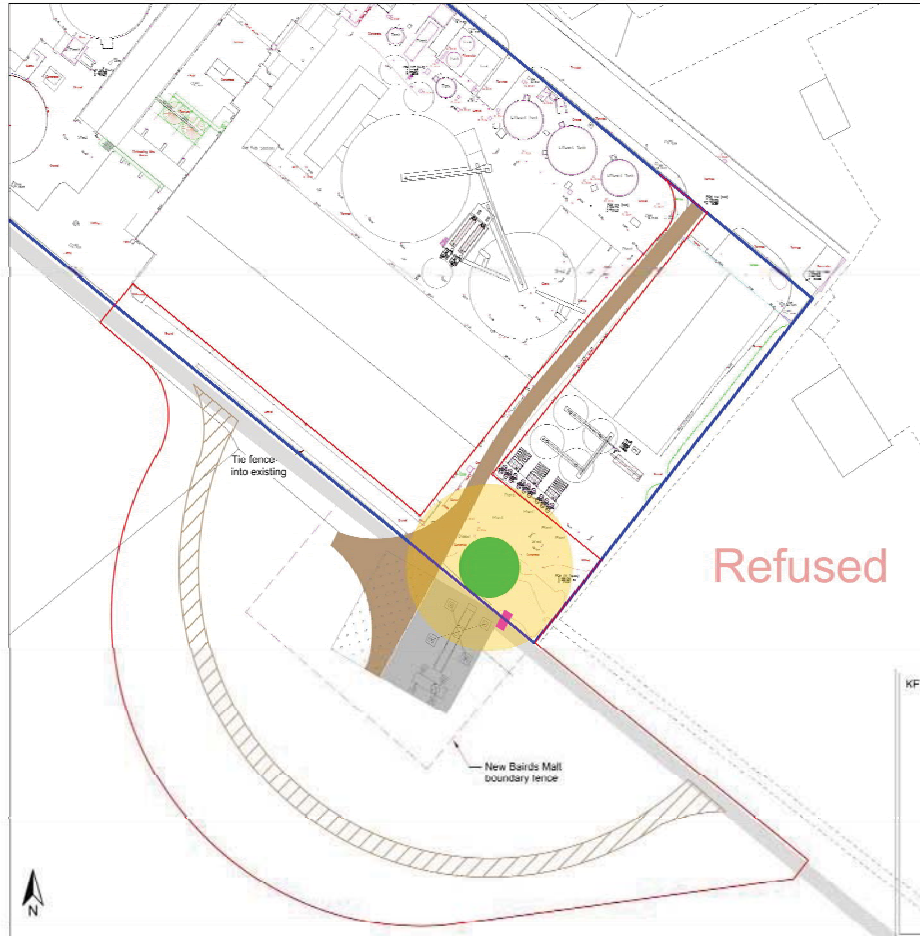
Address: 42 KALUNIE DRIVE

DUNDEE DD4 3PT









**DEVELOPMENT LAYOUT - 1:1,000**

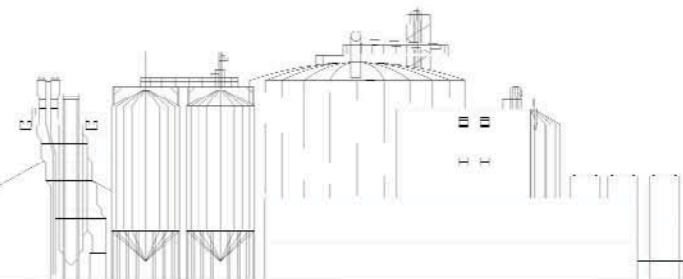
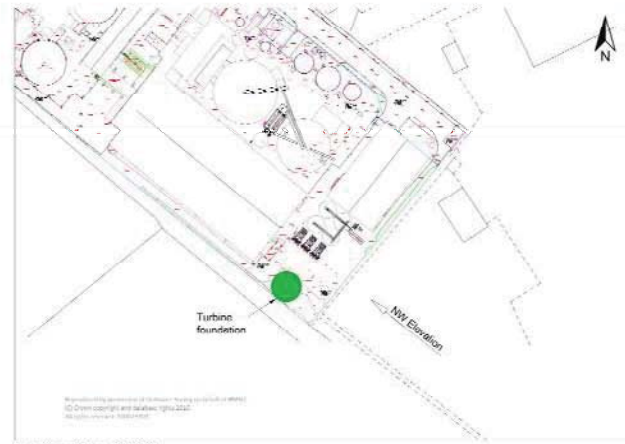
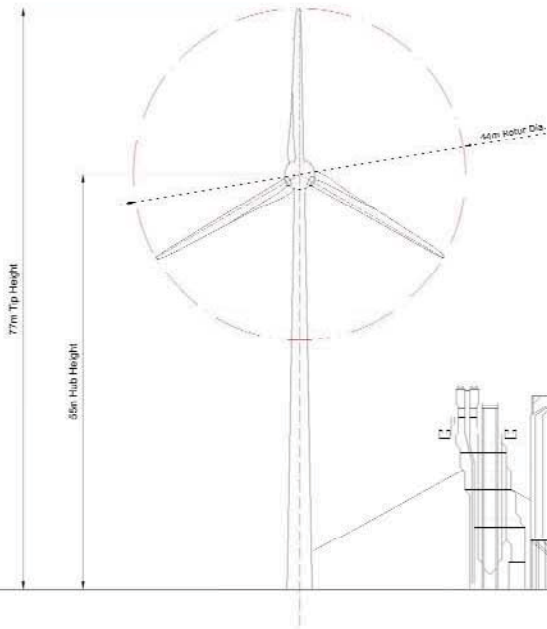
**Project Title:**  
 Bards Malt Wind Turbine  
**Drawing Title:**  
 Site Layout  
**Scale:** SHOWN @ A3

Date drawn:	Rev.	Date	Description	Chk'd
17.12.14				
<b>Stage:</b> Planning				
<b>Drawn by:</b> LS				
<b>Checked by:</b> GM				
<b>Approved by:</b> SE				

**Clients:**  
 Bards Malt Single Turbine Ltd  
 Job No. C0621-163 | Drg No. App-001

**GREEN CAT RENEWABLES LTD**  
 Midlothian Innovation Centre,  
 Pentlandsfield, Edinburgh,  
 EH25 9RE.  
 Tel: 0131 440 9953  
 www.greencatrenewables.co.uk

Refused



Project Title:  
**Bairds Malt Wind Turbine**

Drawing Title:  
**Turbine Elevation Looking North-West**

Scale: 1:500 @ A3

Date drawn: 17.12.14	Rev.	Date	Description	Chk'd
Stage: Planning				
Drawn by: AF				
Checked by: GM				
Approved by: SE				

Client:  
**Bairds Malt Single Turbine Ltd**

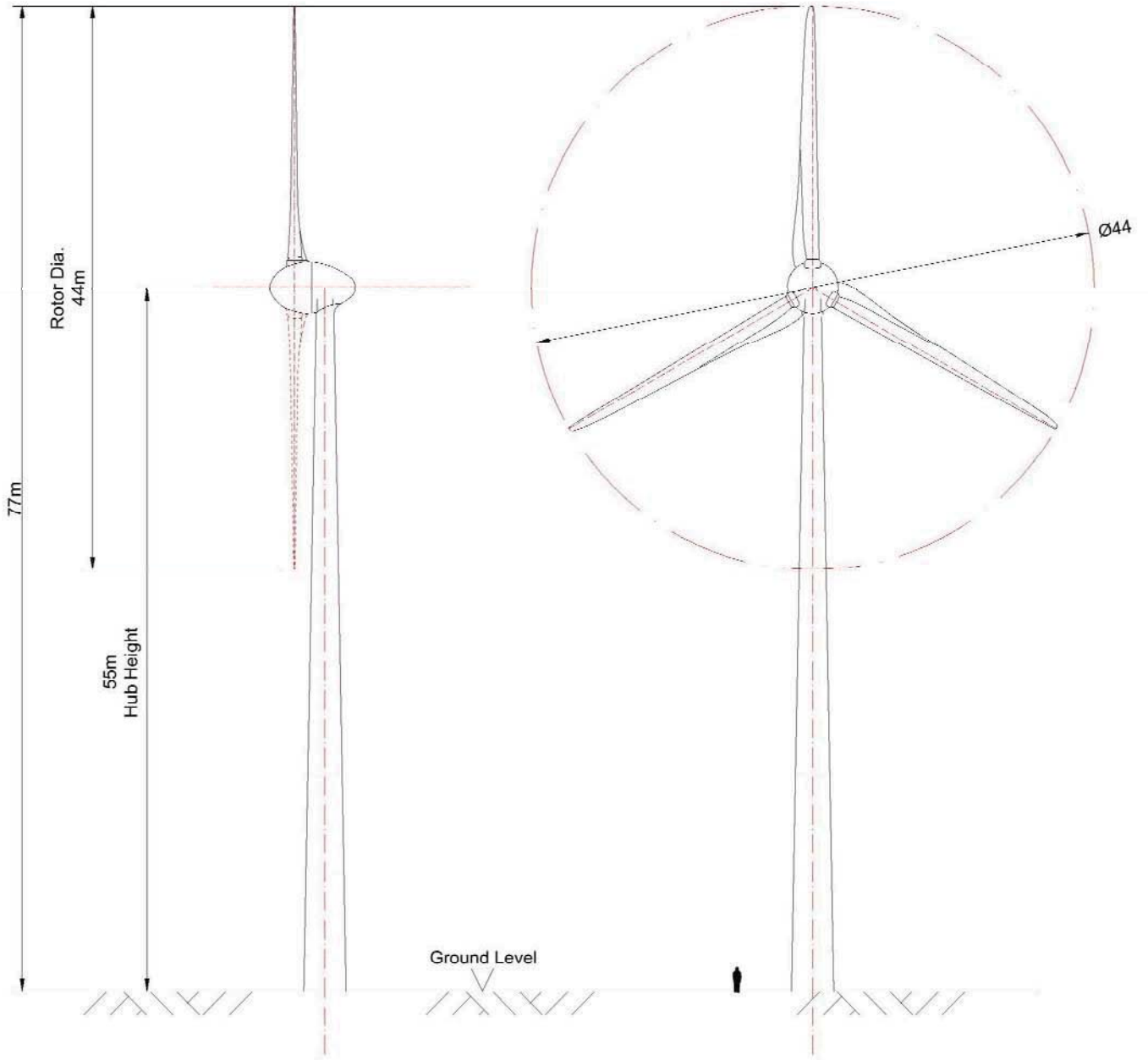
Job No. C0621-163 | Dwg No. App-003

**GREEN CAT RENEWABLES LTD**



Milnthorpe Innovation Centre,  
Fenitlandfield, Edinburgh,  
EH25 9RE.  
Tel: 0131 440 9053  
www.greencatrenewables.co.uk

Refused



Project Title:		Date drawn:	Client:	<b>GREEN CAT RENEWABLES LTD</b>	
Bairds Malt Wind Turbine		17.12.14			Bairds Malt Single Turbine Ltd
Drawing Title:		Stage:			
Turbine Elevation		Planning			
Job No. C0621-163	Drawing No. App-002	Scale: 1:500 @ A4			
		Drawn by: AF			
		Checked by: GM			
		Approved by: SE			
				Midlothian Innovation Centre, Pentlandfield, Edinburgh, EH25 9RE.	
				Tel: 0131 440 9053	
				www.greencatrenewables.co.uk	







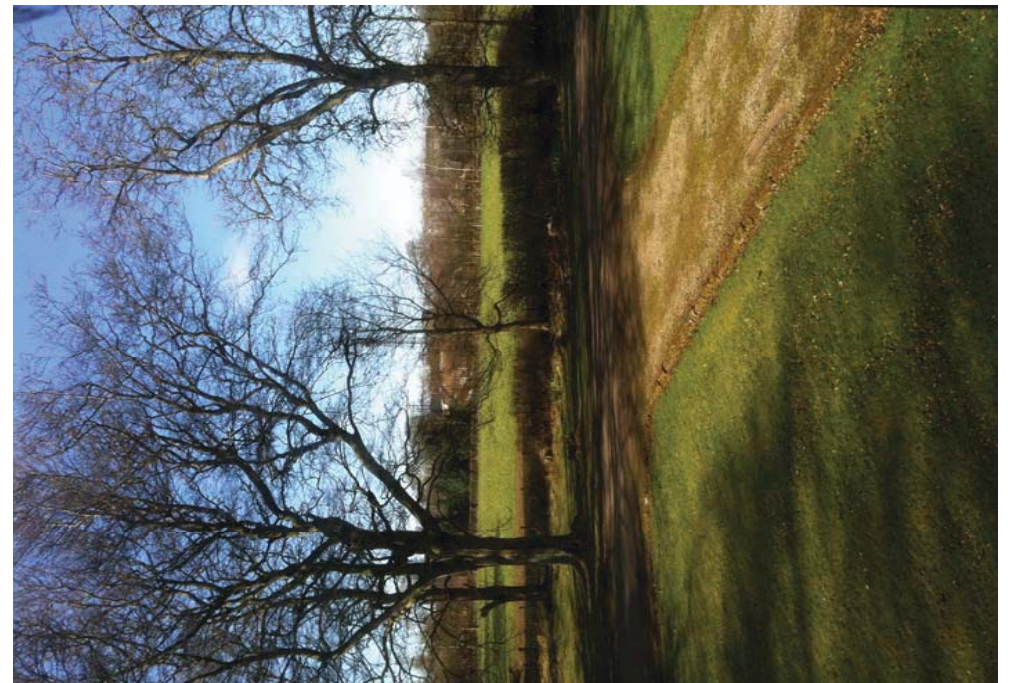


































































TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997  
(AS AMENDED)  
TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)  
(SCOTLAND)  
REGULATIONS 2013

PLANNING PERMISSION REFUSAL  
REFERENCE 14/01067/FULL

To **Bairds Malt Single Turbine Ltd**  
**c/o Green Cat Renewables**  
**Edinburgh Office**  
**Midlothian Innovation Centre**  
**Room 106**  
**Roslin**  
**EH25 9RE**

With reference to your application dated 9 January 2015 for planning permission under the above mentioned Acts and Regulations for the following development, viz.:-

**Erection Of Wind Turbine Of 55M To Hub Height And 77M To Blade Tip And Ancillary Development at Bairds Malt Peasiehill Road Elliot Industrial Estate Arbroath DD11 2NJ for Bairds Malt Single Turbine Ltd**

The Angus Council in exercise of their powers under the above mentioned Acts and Regulations hereby **Refuse Planning Permission (Delegated Decision)** for the said development in accordance with the particulars given in the application and plans docqueted as relative hereto in paper or identified as refused on the Public Access portal.

**The reasons for the Council's decision are:-**

- 1 That the application is contrary to policies S1 criterion (a), S6 criteria (b), and ER34 criterion (a) of the Angus Local Plan Review (2009) as the proposed development would give rise to unacceptable impacts on the occupants of residential property by virtue of the height of the wind turbine and its proximity to residential properties.
- 2 That the application is contrary to Policy 6 of TAYplan and policies ER5 and ER34 criterion (b) of the Angus Local Plan Review (2009) as the proposed development would result in unacceptable adverse landscape impacts having regard to landscape character and setting within the immediate and wider landscape.

**Amendments:**

The application has not been subject of variation.

Dated this **1 March 2016**

Iain Mitchell - Service Manager  
Angus Council  
Communities  
Planning  
County Buildings  
Market Street  
FORFAR  
DD8 3LG



**BAIRDS MALT WIND TURBINE**

**Environmental Report**

**Bairds Malt Single Turbine Ltd**

December 2014





---

**Environmental Report****Prepared for:**

Bairds Malt Single Turbine Ltd

**BAIRDS MALT WIND TURBINE****Prepared By:**

Green Cat Renewables Ltd.



Green Cat Renewables

Checked By: Glen Moon	Date: 17/12/2014
Approved By: Stephanie Ewing	Date: 18/12/2014



## **Preface**

This Environmental Report seeks assessed the environmental effects of the proposed Bairds Malt wind turbine development, which comprises the installation and operation of a single wind turbine of 77m to blade tip height.

As a single turbine with a hub height in excess of 15m, the proposed development falls within Schedule 2 of the EIA Regulations (Scotland) 2011.

A Screening Request was submitted to Angus Council in October 2012, who determined that an Environmental Impact Assessment for the proposed development was not required (ref: 12/00922/EIASCR). The Council indicated that the application should be accompanied by a detailed Environmental Appraisal document.





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Appendix 1 - Ecology

Appendix 2 – Landscape and Visual

Appendix 3 – Noise

Appendix 4 - Cultural Heritage

Appendix 5 – Shadow Flicker

Appendix 6 – Socio-Economic Impact Report



# 1 Project Summary

## 1.1 Introduction

The proposed development comprises the installation and operation of a single wind turbine, of 77m to blade tip height. The turbine would be located in the southern corner of the Bairds Malt plant, on the western edge of Elliot Industrial Estate, Arbroath.

This report assesses the potential environmental impacts likely to results from the proposal, and has been produced in line with relevant environmental policies and planning guidance.

## 1.2 Background

Bairds Malt Ltd is proposing the development of a single turbine at their plant on Elliot Industrial Estate, which will help secure the future of the facility and safeguard local jobs.

The application, would, if consented, help minimise the company's high energy costs and generate renewable energy on-site. Energy consumption at the plant costs Bairds Malt ~£2.5million per annum in energy bills and the turbine would reduce the electricity consumption from the National Grid by a third; a significant saving for the Arbroath facility.

Bairds Malt is working with Kilmac Construction on the development. Kilmac is a Tayside-based company who has worked with Bairds Malt for a number of years and has to date undertaken over 100 projects in Angus.

As Scotland's leading malt producer the Bairds Malt process 255,000 tonnes of malt per year, which is destined primarily for distilling. The company has invested significantly in its Arbroath facility since its construction in 1970, which has included major upgrades in 1980 and 2009, the latter ensuring that the site now incorporates the latest innovations in maltings technology.

The Arbroath facility, with its new grain drying complex is now capable of producing over 300 tonnes of malt (circa 174,000 bottles of whisky) every 48 hours, with total annual production reaching over 57,000 tonnes. The site employs 57 people who are drawn from the local area and the business is supplied by 230 live farm accounts within Angus alone.

## 1.3 Aims of the Project

In constant operation for seven days a week, the Malt has an extremely high energy usage and requires in the region of 10GWh of electricity per year, the equivalent of the supply required for 2,200 homes. The main aims of the project are to:

- **Generate clean electricity.** The proposed turbine is expected to generate 2.3GWh of electricity per year, equivalent to around 20% of the plant's usage.

- **Reduce business costs** through the direct use of electricity generated on site, and through the sale of any electricity not used by the plant. This will have the added bonus of insulating the business against any future price rises in electricity.
- **Reduce the businesses' carbon footprint**, which is of increasing importance to major suppliers.

The overall outcome of the project will be to deliver production and cost efficiencies that will increase the market competitiveness of the business and thus safeguard local jobs.

## **1.4 Community Consultation**

A public information event was held at Bairds Malt on Wednesday 3<sup>rd</sup> and Thursday 4<sup>th</sup> July 2013. The drop-in events ran from **2pm to 7pm** and provided details about the proposed scheme, and presented the findings of the environmental studies that had been carried out to date. Representatives from Bairds Malt, Kilmac Energy and members of the Green Cat Renewables project team were on hand to answer any questions members of the public had about the scheme.

The event was advertised in the Forfar Dispatch on Tuesday 19<sup>th</sup> November and was covered in an article in the Dundee Courier on 25<sup>th</sup> June 2014. In addition to this, an invitation was posted to each property on the Patrick Allan Fraser estate. Letters were also sent to each of the local councillors and Graeme Day, MSP for Angus South.

Bairds Malt were keen to provide as much information as possible to members of the public prior to the application being lodged, and the event itself was well attended.

The scheme was also presented to Arbirlot Community Council on 14<sup>th</sup> July 2014.

## **1.5 Scope of the Environmental Report**

The scope of the assessments has been discussed and agreed with Angus Council and other consultees through an informal scoping exercise. The Environmental Report (ER) comprises the following sections:

- The Proposed Development (including Traffic and Transport);
- Planning and Environmental Policy Context;
- Local Economic Benefits;
- Project Design Considerations;
- Ecology and Ornithology;
- Landscape and Visual Impact;
- Noise;
- Cultural Heritage and Archaeology;
- Surface and Groundwater Hydrology;
- Existing Infrastructure, Telecommunications, Television, Aviation and Electromagnetic Safety;
- Shadow Flicker; and
- Climate Change



## 2 The Proposed Development

### 2.1 Purpose of the Development

#### Why wind?

Bairds Malt has considered a range of renewable sources, and a wind turbine was the favoured option as it maximises the potential of the site, taking up a small footprint and generating a substantial amount of electricity.

Other technologies considered were:

- Solar power – this required a large development footprint, and given the constrained site, the amount of electricity generated would be a small proportion of that used by the Maltings.
- Geothermal power – this was not technically viable on the site.
- Biomass – again required a larger footprint than that available on the site, and there were concerns about the overall sustainability of this option.

None of the above technologies were commercially viable on the Bairds site, and therefore the decision was taken to investigate a wind turbine, which was the clear option to emerge.

#### Electricity generation

The malting process requires significant levels of energy consumption by the business, with an annual requirement in the region of 10GWh - the businesses' largest costs. As well as being connected to the National Grid, the proposed turbines will supply 'green' electricity directly to the plant, resulting in an efficient use of a natural resource, and significant financial savings. The proposed turbine will supply 20% of the plant's electricity, and it is anticipated that all of the electricity generated will be used directly by the plant.

#### Business diversification

The addition of the turbine will lead to an additional source of income for the business which will help to cushion it from market volatility caused by significant annual factors such as grain harvests and fluctuating commodity prices. Operating in a competitive European market, an increase in the sustainability and stability of the business will also help support both the existing employment and create new employment as the business continues to expand.

#### Reduction of the business' carbon footprint

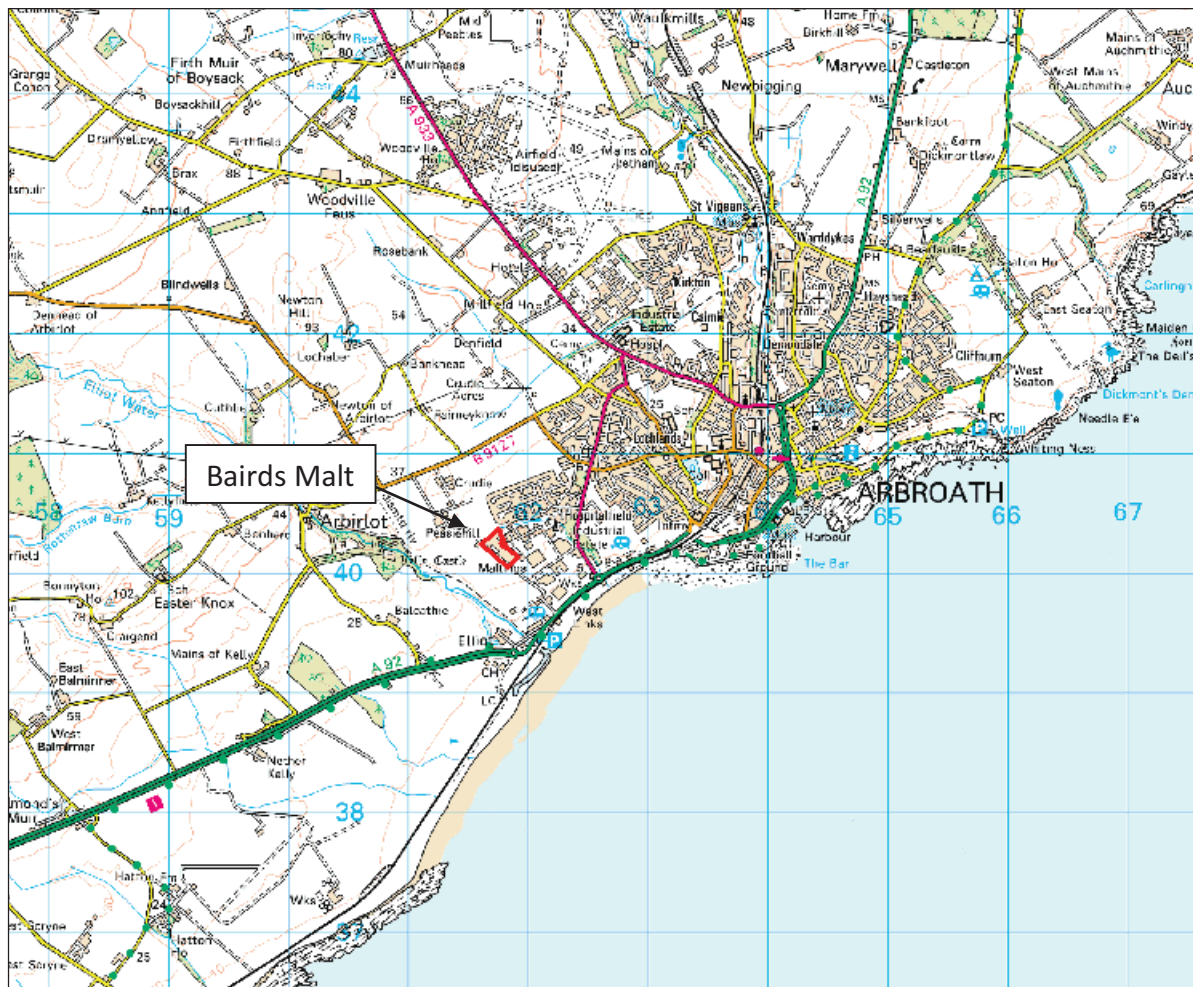
As a high energy user involved in the supply of products to large suppliers throughout the UK and beyond, the business is seeking to improve its sustainability and reduce its carbon footprint. The need to demonstrate commitment to sustainability is increasing as customers demand higher environmental standards from their suppliers. Thus the development of renewable energy should increase the attractiveness of the Malt's produce to suppliers through its sustainable production.

## Summary

The development of wind energy at Bairds Malt will provide the business with a source of renewable energy to meet its extremely high energy demand whilst at the same time significantly reducing the business' carbon footprint.

## 2.2 The Site

The Bairds Malt site is located on the western edge of Arbroath on the Elliot Industrial Estate, in an area that is not covered by any national planning designation. The proposed development site location is shown in **Figure 2.1**



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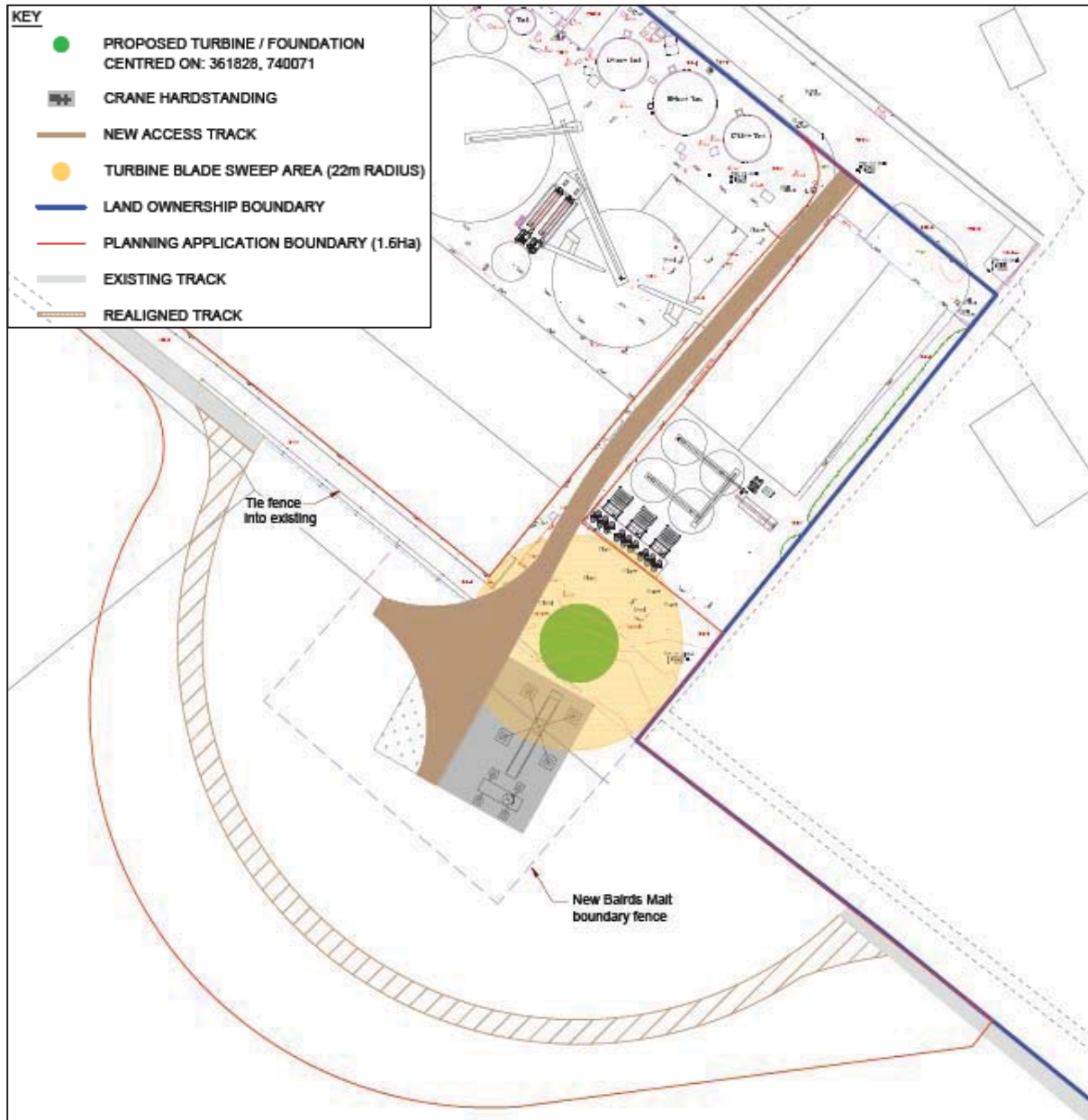
**Figure 2.1 – Site location in the context of Arbroath**

## Turbine location

The proposed development consists of a single wind turbine of 55m to hub and 77m to tip, which would be located in the southern corner of the Bairds Malt site, to the south-west of the prominent Drying Towers which were constructed in 2009. The turbine and foundations would be contained within the boundary of the Maltings, with the crane hardstanding and turning head being located on third-party land immediately to the south-west, as agreed with the landowner.

The development would require a minor diversion to Core Path 152, the access track to Peasiehill Farm. This realignment has been agreed with the landowner. The diverted section of path would be constructed to the same specification as the existing path. A minimum distance of 77m (turbine height) has been provided between the turbine and the path.

The boundary fencing of the Maltings would be extended to encompass the crane hardstanding and turning bell. The proposed site layout is shown in **Figure 2.2**.



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**Figure 2.2 – Site layout**

### Malt Operations

The Bairds Malt site covers approximately 5ha and produces malts for the distilling, brewing and export markets. The site opened in 1970 and has undergone phased development since

then, with major upgrades in 1980 and 2009. A Site Plan showing the major elements of the Bairds operation is provided as **APP-004**.



**Figure 2.3 – Photograph of the site looking south-east from Peasiehill Farm**

The plant is operational 365 days a year, and there is a constant high demand for electricity. Between mid-October and mid-August the focus of activity is generally in the area between Silo 1 and Silo 3, and centred on the Steep House.

For the remaining two months of the year the Steep House is inactive and activity focuses on the southern portion of the site, in the area of the proposed turbine. These activities consist of the unloading of barley into the drying towers, which are active in the second half of August, all of September and for the first half of October. At peak times up to 70 vehicles a day arrive to unload barley, with an average of 15 vehicles per day throughout the remainder of the year.

Lorries enter the site at the eastern gate, and travel between Silo 2 and the site boundary. The vehicles then reverse up the intake ramp to unload, before passing between Silo 1 and the western site boundary and turning right to pass the laboratory buildings and exit the site via the main entrance. Swept path analysis has been undertaken to confirm that this route can continue to be used once the turbine is in place.

Bairds Central Laboratory and Operations Office are located towards the north of the site. The Laboratory carries out malt analysis for all sites in the Bairds Malt group. Within the Operations Office are the Accounts and MIS departments, and the Commercial team which deals with customer sales, delivery schedules, logistics and customer service activities.





*The proposed turbine location*

*The grain drying towers*

*Unloading area for grain lorries, which arrive via the road shown on the right of the picture. Base of drying towers shown on the left of the picture,*

*Egress route for grain lorries and proposed area of turbine foundation*

**Figure 2.4 – The site in the vicinity of the proposed turbine**

The turbine would not affect the operation of the Malt, and the area between the diverted Core Path and the new Maltings boundary fence could continue to be used for agricultural purposes.

### 2.3 The Local Area

The site sits to the north of the A92 and the East Coast Main Railway Line, and is accessed via the A933 and Peasiehill Road. **Figure 2.5** shows the area surrounding the site in more detail.

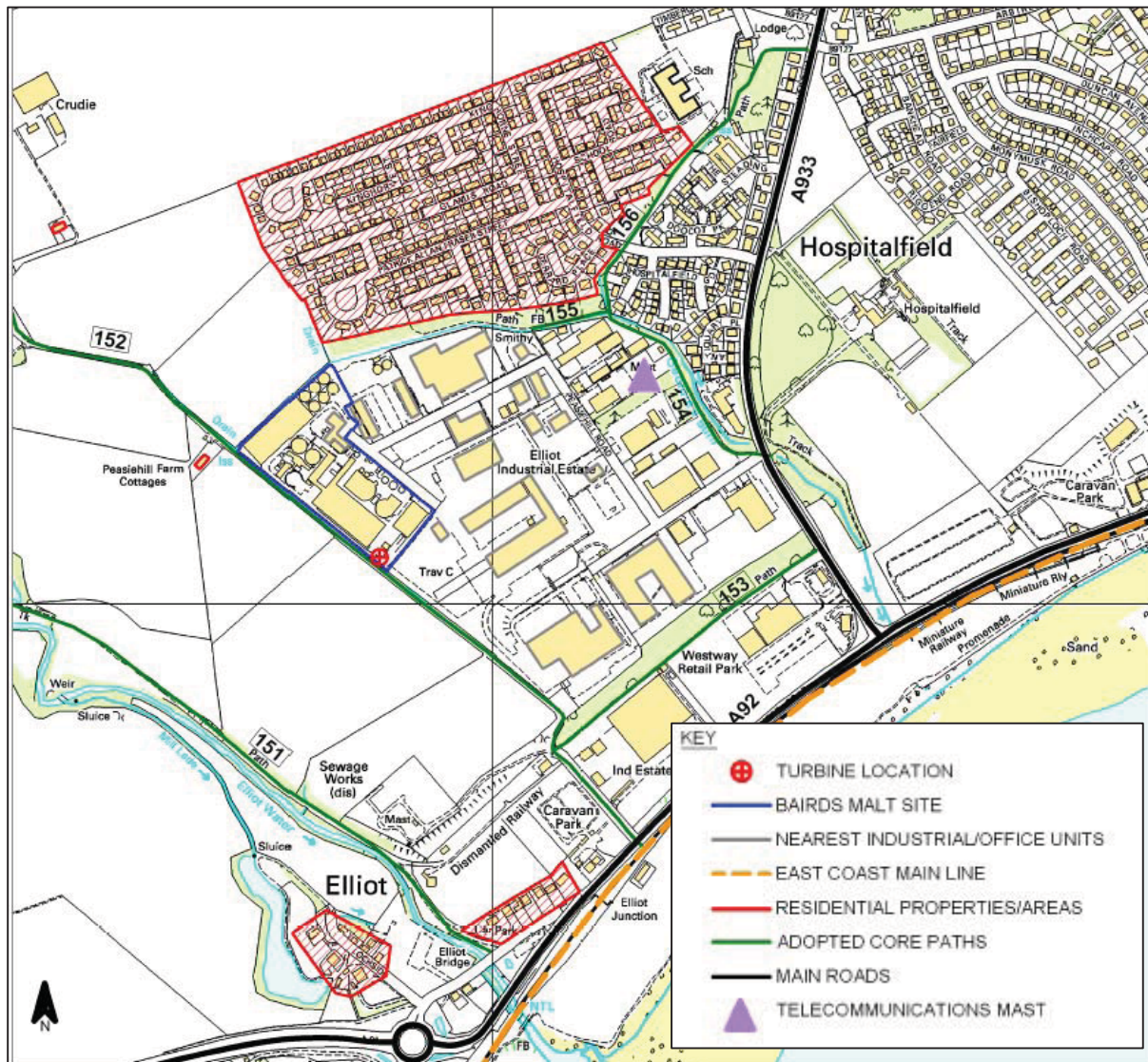


Figure 2.5 – The local area surrounding Bairds Malt

The western edge of Arbroath contains the following elements:

- The Elliot Industrial Estate;
- Commercial / Retail areas such as the Westway Retail Park;
- Residential Areas centred around Patrick Allan-Fraser Street and Hospitalfield Road;
- Open agricultural land such as that to the west of the Elliot Industrial Estate; and
- Single properties and clusters of properties such as those at Peasiehill, Crudie and Elliot Bridge.

### Elliot Industrial Estate

The Bairds Malt site is located on the western edge of the Elliot Industrial Estate which is itself situated on the western edge of Arbroath. It is accessed via Peasiehill Road and the A933, which joins the A92 to the east of the Westway Retail Park. The Estate contains a mixture of industrial and commercial units. These are typically large warehouse type structures, which can contain smaller areas of associated office space, such as those occupied by Halliburton and PMP Interplex. There are also smaller workshop type buildings,

which are typically used for manufacturing or storage purposes. A 40m communications mast in the north-eastern corner of the estate is another prominent feature.

### **Elliott Industrial Estate Extension**

In 2011 Angus Council secured planning permission in principle to extend the Elliot Industrial Estate into the fields to the south-west Bairds Malt. This land, covering a total of 51 hectares, is zoned for employment use within the Local Plan, but is not under the ownership of the Council and would need to undergo compulsory purchase.

It was the Council's intention to service the full site, but it is understood that current plans are to service one half of the site initially, creating a land supply of roughly ten years, with the remainder to be serviced if the extension approaches full occupancy. The initial development would create around 14 plots ranging from about 0.5ha to 2ha in size. The plots would be available for sale to businesses for general manufacturing, storage, office and distribution uses. The construction and build out phase would not be affected by the operation of the proposed turbine.

Compulsory purchase of the site has yet to be completed, and the overall situation is uncertain, with several plots currently lying vacant on the existing industrial estate.

The proposed turbine crane hardstanding and turning head are located in a small portion of the area earmarked for Industrial Estate extension (specifically Plots 24 and 25). The remainder of the proposed extension footprint would be unaffected by the proposed turbine infrastructure.

### **Residential Areas**

The closest residential area to the site is the large housing estate centred on Patrick Allen-Fraser Street, the closest property of which is situated 350m to the north of the proposed turbine location. The closest residential properties to the site are the conjoined Peasiehill Farm Cottages, which are situated 300m to the north-west of the proposed turbine. These properties, and Peasiehill Farm itself, are owned by a party with a financial interest in the turbine development.

The Elliot Caravan Park is located 450m to the south of the proposed turbine location, and is accessed directly from the A92 Westway.

### **Public Access**

There are several Core Paths in the vicinity of the site. Core Path 152 runs along the western boundary of the Elliot Industrial Estate, linking the West Sands in the south with Peasiehill Farm and the B9127 to the east of Arbirlot. This path would need to be diverted as part of the proposed development to loop around the area of the crane pad and hardstanding, and this diversion has been agreed with the landowner.

Core Path 151 is situated 350m to the south-west of Core Path 152, and runs in a north-westerly direction from Elliott Bridge to Arbirlot, passing to the east of Kellie Castle. This path runs along the route of a disused railway line.



Core Path 153 links Core Path 152 to Peasiehill Road, running to the north of Westway Retail Park. There are three further sections of Core Path in the area, which run along the eastern edge of the Elliot Industrial Estate and pass Muirfield Primary School.

## 2.4 Description of the Proposed Wind Turbine

A diagram of the principal dimensions of the Enercon E44, which is the most likely turbine for the development, is shown in **Figure 2.6**, and a scaled drawing is included as **APP-002**.

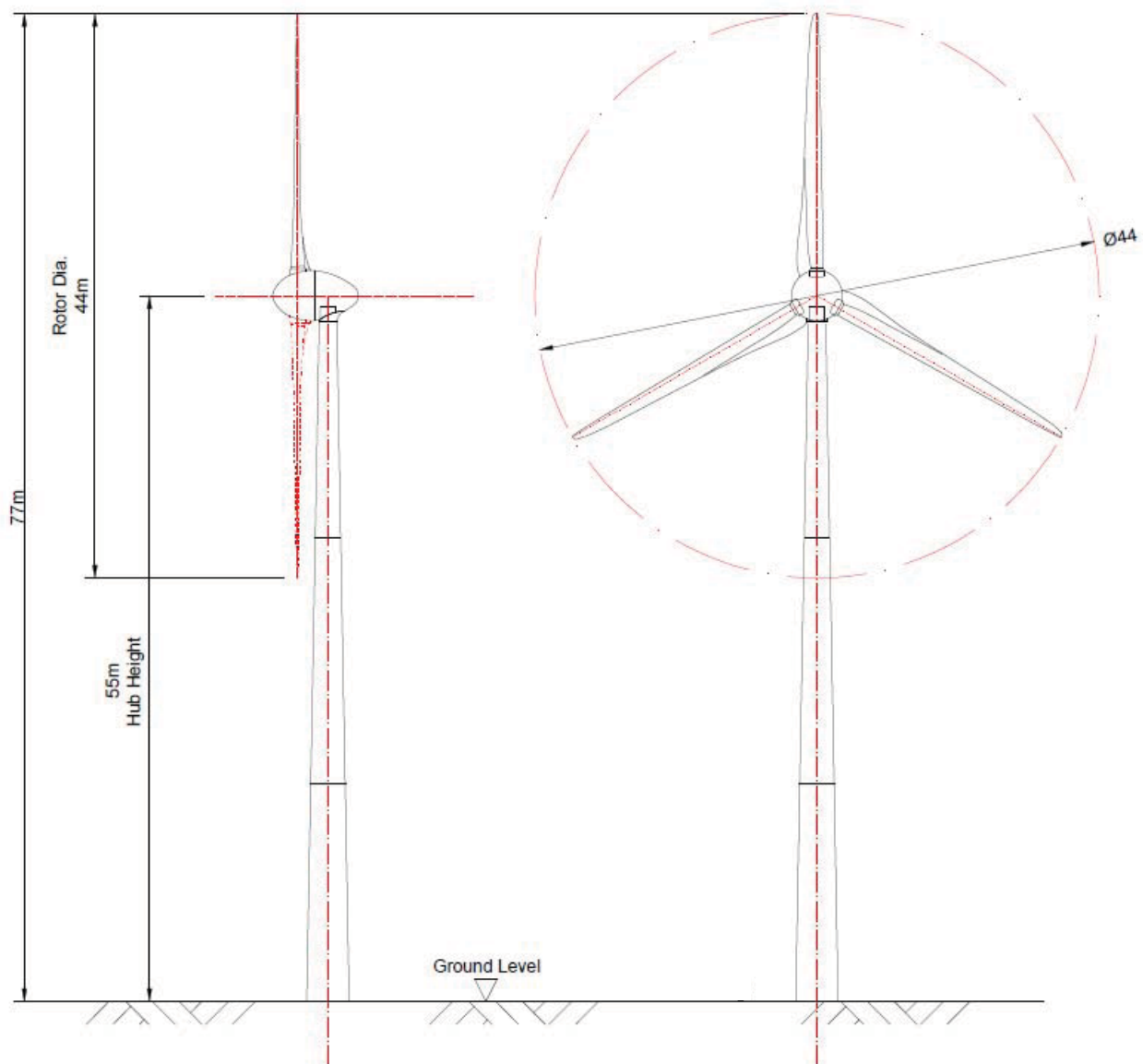


Figure 2.4 - Enercon E44 wind turbine showing principal dimensions

The key dimensions of the Enercon E44 are summarised in **Table 2.2**.

Table 2.2 – Key dimensions of the Enercon E48

Dimension	Length (m)
Hub height	55
Rotor diameter	44
Total height	77

The nacelle housing contains the generator and other operating equipment. The transformer of the candidate machine is contained inside the tower base. It is proposed that the finish of the wind turbine, tower and blades will be semi-matt and will be pale grey in colour.

Unlike some other makes of wind turbines that are programmed to stop when the wind speed exceeds 25m/s ('cut-out' wind speed), Enercon wind turbines are fitted with a storm control feature which enables the turbine to continue to operate in very high wind speeds; this avoids the need for sudden shutdowns and the resulting energy yield losses.

## **2.5 Associated Infrastructure**

### **Site Tracks and Crane Hardstanding**

The proposed access route to the construction area is well surfaced and would be suitable for the turbine construction traffic without the need for reinforcement.

Construction of the small area of access track, turbine head and crane hardstanding to the south-west of the turbine would involve the removal of the vegetation and top soil to a depth of approximately 200 mm. This would be stored adjacent to the tracks for later, partial reinstatement. Where necessary, a geotextile layer would be placed directly onto the exposed subsoil, upon which the crushed rock would be placed.

Appropriate drainage requirements would be incorporated where the site specific conditions make this necessary. If any areas of softer ground are encountered, the depth of crushed rock may need to increase to approximately 700 mm and a layer of geotextile material embedded within the structure would be used.

The crane platform would be of similar construction to the access tracks, designed to withstand the maximum load bearing applied by the crane during the construction process.

**Figure 2.7** shows the specification of the required crane hardstanding.

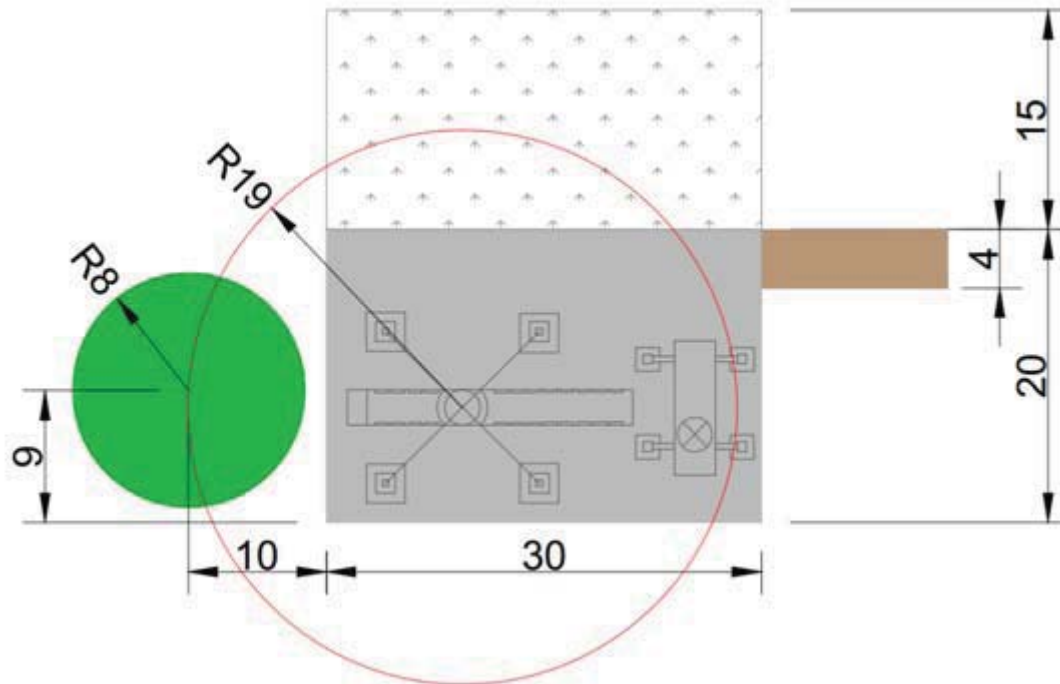


Figure 2.7 – Crane and hardstanding diagram

Any excess earth excavated during the construction phase would be stored behind the foundations. Reinstatement of the track verges and the areas of hardstanding will be undertaken where appropriate. As there would be a continuing need to use the hardstanding and turning head, these would be left in place for the lifetime of the development.

### Construction Compound

The local ground works contractor would set up a small compound for site offices, welfare facilities and storage of tools. It is likely that these could be accommodated within the existing Maltings buildings.

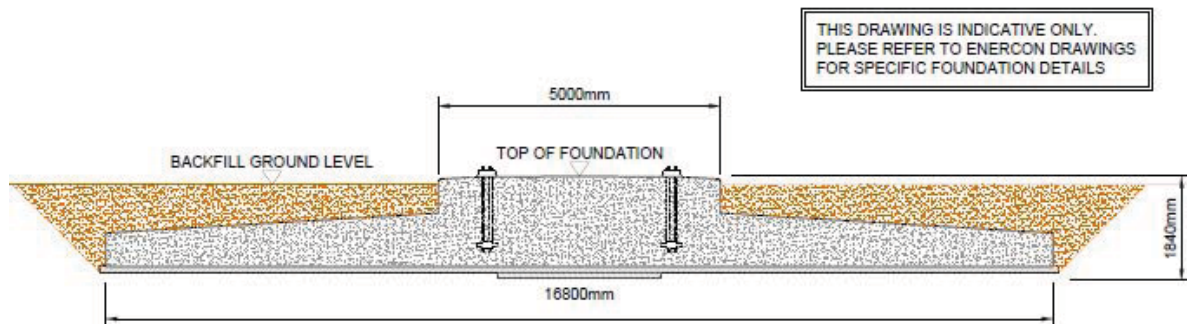
### Turbine Foundations

The turbine's foundations will be designed as either buoyant or non-buoyant. Buoyant foundations are larger and have been used as a conservative assumption in this assessment, though the need for a buoyant foundation is deemed to be extremely unlikely. **Figure 2.6** shows the typical dimensions of a buoyant turbine foundation. The foundation would have a diameter of up to 16 m, and a depth of approximately 1.7 m. When the foundations are excavated, a further metre around the foundation will be dug to allow access during construction. A thin layer, called a 'blinding layer', will be poured to provide a surface on which the foundation can be constructed. Conservatively, each foundation would comprise:

- 29 tonnes of steel reinforcement bars;
- 181 cubic metres of concrete; and
- 23 tonnes concrete blinding layer slab.

As can be seen in **Figure 2.8**, the turbine foundations will be covered by topsoil when construction is complete, leaving a plinth of about 5.5m in diameter just above the surface

level, upon which the turbine would be bolted. Much of the excavated material will be used for this back-filling.



**Figure 2.8 – Typical buoyant foundation dimensions for E44 turbine**

The Balance of Plant work, inclusive of foundation construction and electrical installation will be undertaken by Kilmac, the project's construction partner, who are a local contractor employing in excess of 100 employees throughout Tayside.

## 2.6 Grid / Local Electrical Connection

The wind turbine envisaged for use on this site produces electricity at 400 volts. This would be transformed to 11 using a transformer within the turbines. Grid connection has been secured with Scottish and Southern Energy.

From the transformer, underground cable runs will link the turbine to the existing substation within the Malt, the location of which is shown in **APP-001**.

**Figure 2.9** shows the proposed scenario at Bairds Malt, where the turbine will supply electricity to the Maltings and export any excess onto the grid. It is anticipated that virtually all of the energy generated by the turbine will be used on-site.

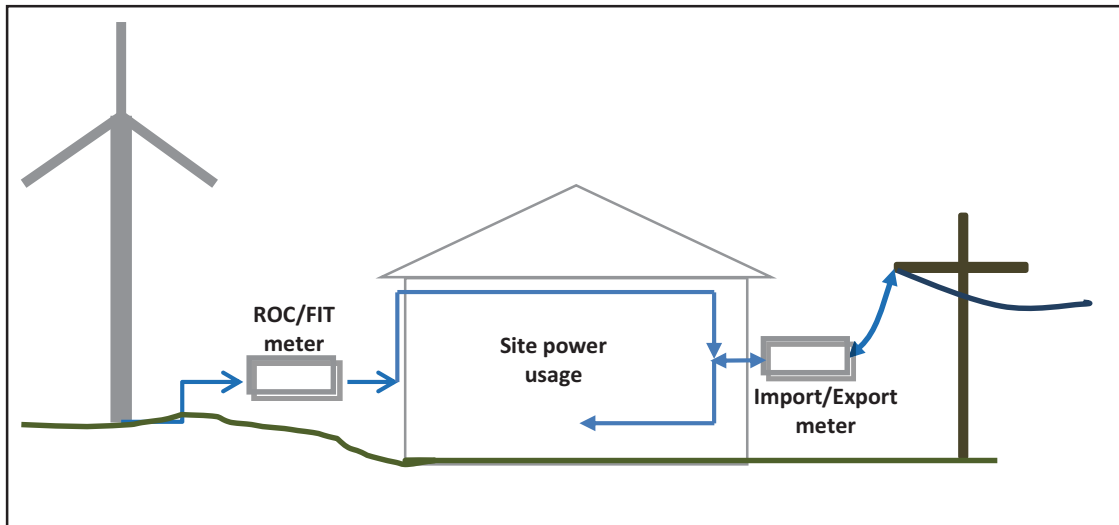


Figure 2.9 - Metering system schematic with on-site power usage

## 2.7 Access to the Site

It is intended that the turbines would be landed at Montrose and then transported south to the southern outskirts of Arbroath on the A92. Access to the site would be via the A933 and Peasiehill Road. The turbine components and construction traffic would enter the Bairds site via an existing gate to the north-west of Silo 2, and then proceed along the western edge of Silo 2 to reach the construction area.

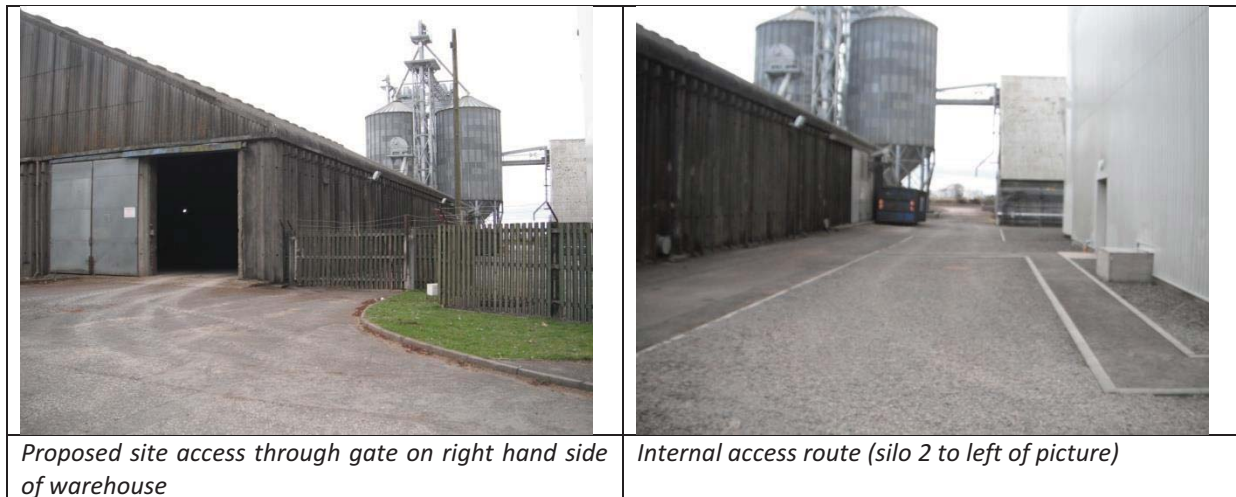


Figure 2.10 – Site access arrangements

## 2.8 Construction Programme

The construction phase would start after the financial and due diligence process has been completed and would be on-going for approximately 2-3 months, from construction of the crane hardstanding and foundation through to erection and commissioning of the turbine.

## 2.9 Construction Traffic

There are three distinct phases of the development in traffic terms:

- Construction;
- Operation; and
- Decommissioning.

### Construction traffic

The traffic involved throughout the construction phase includes the turbine component delivery vehicles, lorries with aggregates for construction of the small section of new track and crane hardstandings, concrete deliveries for the foundation, reinforcement steel and cabling, as well as personnel commuting. **Table 2.4** gives an estimate of the volume of traffic likely to be involved during the construction phase.

**Table 2.4 – Construction Traffic**

	Load	Number of deliveries
<b>Aggregate for new and upgraded track and crane hardstanding</b>	~330 m <sup>3</sup>	40
<b>Concrete turbine foundations</b>	~210 m <sup>3</sup>	26
<b>Reinforcement steel</b>	29 tonnes	2
<b>Cabling</b>	Unknown	One lorry can carry several reels of cable, normally one lorry will provide for the whole project
<b>Personnel</b>	-	6-10 cars/vans a day at peak time
<b>Turbine components</b>	-	5 articulated lorries

Wind turbine components would be delivered to the site on articulated lorries. Extended trailers would be used to deliver the turbine blades which are 22m in length.

The largest type of crane required is a Liebherr LTM 1500-8.1 mobile crane, which is 21.4m long, 3.2m wide and has a 500 tonne lift capacity. The crane has eight axles, all of which have axle loads of 12 tonnes, so the total vehicle weight is 96 tonnes. Aggregate would be sourced from the most convenient local quarry.

### Operational traffic

Once erected the wind turbine would operate automatically. Typically, Enercon maintenance teams are scheduled to conduct quarterly checks on the operation of turbines. These are undertaken in light commercial vehicles such as vans, cars or similar vehicles

### Decommissioning traffic

The amount of site traffic during decommissioning would be less than that during the construction stage.

## 2.10 Decommissioning

At the end of the development's operational life, the wind turbines would be decommissioned, the principal elements removed, and the site restored leaving little, if any, visible trace.

The wind turbine would be removed from the site and the foundations, tracks and hardstandings would be covered over with topsoil and reseeded. The cables would be de-energised and left in place, with any cable marker signs removed.

The decommissioning process would take approximately two months to complete. A decommissioning programme would be agreed with the relevant authority prior to the commencement of decommissioning works.



### 3 Planning and Environmental Policy Context

An application for the development of a wind project should be assessed in the context of national policy and guidance; the local planning authority development plan; and supplementary planning guidance.

#### 3.1 National Planning Policy Guidance

The main driving force that has led to the legally binding UK renewable energy target of 15% is the mandatory EU 2020 Targets: reduction of greenhouse gas emissions by 20% and an increase in the proportion of final energy consumption from renewable sources to 20% by 2020.

The current SPP (2014) has identified targets for delivering renewable sources of electricity and *'supports the transformational change to a low carbon economy, consistent with national objects and targets.'* Within the SPP it indicates that:

- 30% of overall energy demand from renewable sources by 2020;
- 11% of heat demand from renewable sources by 2020; and
- The equivalent of 100% of electricity demand from renewable sources by 2020.

Capitalising on the potential of the renewable energy sector is a major cornerstone of the Scottish Government's principle objective of facilitating sustainable economic growth. This includes the encouragement and support of diversification and the growth of the rural economy. Indicating that it *'promotes economic activity and diversification, where appropriate sustainable development linked to tourism, forestry, farm and croft diversification, aquaculture, nature conservation and renewable energy developments'*.

Scottish Planning Policy (SPP, 2014) is the statement of the Scottish Government's policy on nationally important land use planning matters. It sets out:

- The Scottish Government's view of planning;
- The core principles for the operation of the system;
- Statutory guidance on sustainable development and planning;
- Concise subject planning policies; and
- Expectations of the intended outcomes.

SPP aims to ensure the delivery of national renewable energy targets, and states that *'planning must facilitate the transition to a low carbon economy, and help deliver the aims of the Scottish Government's Report of Proposals and Policies'*.

With regard to promoting rural development it states (paragraph 74) that *'NPF3 sets out a vision for vibrant rural, coastal and island areas, with growing, sustainable communities supported by new opportunities for employment and education.'* It goes on to explain how the planning system should:

- In all rural and island areas promote a pattern of development that is appropriate to the character of the particular rural area and the challenges it faces;
- Encourage rural development that supports prosperous and sustainable communities and businesses whilst protecting and enhancing environmental quality; and
- Support an integrated approach to coastal planning.

With regard to renewable energy and government commitments to reduce CO<sub>2</sub> emissions it states (paragraph 153) that *'Terrestrial and marine planning facilitate development of renewable energy technologies, link generation with consumers and guide new infrastructure to appropriate locations. Efficient supply of low carbon and low cost heat generation of heat and electricity from renewable energy sources are vital to reducing greenhouse gas emissions and can create significant opportunities for communities.'*

In relation to renewable energy applications it states that (paragraph 154) *'The planning system should support the development of a diverse range of electricity generation from renewable energy technologies – including the expansion of renewable energy generation capacity and the development of heat networks.'*

Development plans are required to guide development to appropriate locations and should *'seek to ensure an area's full potential for electricity and heat from renewable sources is achieved, in line with the national climate change targets, giving due regard to relevant environmental, community and cumulative impact considerations.'* (Paragraph 155).

Specifically for wind developments the SPP encourages the use of a spatial framework which *'identifies those areas that are likely to be most appropriate for onshore wind farms as a guide for developers and communities.'* It also provides a spatial framework table outlining appropriate and non-appropriate areas, with three distinct groups:

- Group 1: Areas where wind farms will not be acceptable – National Park and National Scenic Areas;
- Group 2: Areas of significant protection – National and international designations, other nationally important mapped environmental interests and community separation for consideration of visual impact; and
- Group 3: Areas with potential for wind farm development – beyond groups 1 and 2 wind farms are likely to be acceptable, subject to detailed consideration against identified policy criteria.

The SPP states that in relation to the spatial framework *'local development planning authorities, working together where required, should identify where there is strategic capacity for wind farms, and areas with the greatest potential for wind development, considering cross-boundary constraints and opportunities.'*

NPF3 was laid before the Scottish Parliament on 23<sup>rd</sup> June 2014 and confirms target of at least 30% of overall energy demand from renewables by 2020 including generating the equivalent of at least 100% of gross electricity consumption from renewables, with an interim target of 50% by 2015.

### 3.2 Local Planning Policy

The key local development documents are:

- TAYplan (Approved 2012):
- Angus Local Plan Review (Adopted 2009)

In addition to the development plan a number of other publications are also particularly relevant to the consideration of the application. These include:

- Tayside Landscape Character Assessment (1998);
- Angus Council Implementation Guide for Renewable Energy Proposals (2012);
- Angus Windfarms Landscape Capacity and Cumulative Impacts Study (Ironsides Farrar, 2008);
- Strategic Landscape Capacity Assessment for Wind Energy in Angus (prepared by Ironsides Farrar for Angus Council and SNH, November 2013)

#### TAYplan: Scotland's SusTAYnable Region

In June 2012, TAYplan replaced the Dundee and Angus Structure Plan 2002 and became the statutory Strategic Development Plan. The plan embraces sustainability stating in the foreword *'We want to provide future generations with opportunities to improve their lives; what better legacy to leave our children. Therefore the mitigation of and adaptation to climate change, as the single greatest challenge facing humankind, is central to this Plan. We must shift to a low carbon and zero waste economy by using our land and resources more efficiently.'*

This is embodied in the Vision and Objectives which aims to 'support the switch to a low carbon and zero waste economy' and to *'strengthen the economic base to support the renewable energy and local carbon technology sectors'*.

Policy 6: Energy and Waste/Resource Management Infrastructure requires the Local Development Plans to identify areas suitable for different forms of renewable heat and electricity infrastructure with areas of search, allocated sites and decisions on proposals taking into account:

- *'The specific land take requirements associated with the infrastructure technology and associated statutory safety exclusion zones where appropriate;*
- *Proximity of resources (e.g. woodland, wind or waste material); and to users/customers, grid connections and*
- *distribution networks for the heat, power or physical materials and waste products, where appropriate;*
- *Anticipated effects of construction and operation on air quality, emissions, noise, odour, surface and ground water pollution, drainage, waste disposal, radar installations and flight paths, and, of nuisance impacts on off-site properties;*

- Sensitivity of landscapes (informed by landscape character assessments and other work), the water environment, biodiversity, geo-diversity, habitats, tourism, recreational access and listed/scheduled buildings and structures;
- Impacts of associated new grid connections and distribution or access infrastructure;
- Cumulative impacts of the scale and massing of multiple developments, including existing infrastructure;
- Impacts upon neighbouring planning authorities (both within and outwith TAYplan); and,
- Consistency with the National Planning Framework and its Action Programme’.

### The Angus Local Plan Review (Adopted 2009)

This is the local element of the statutory Local Development Plan and is therefore the prime policy against which applications are determined.

**Table 3.1** presents the main relevant aims and policies set out within the ALPR, and discusses the compliance of the Bairds Malt Scheme with these.

ALPR Aim / Policy	Policy	Comment
Aim 2, p6	<i>Create the conditions for a vibrant and diverse economy providing increased and varied job opportunities.</i>	The turbine will support an established local business and help to it to consolidate and expand in the European marketplace.
Aim 3, p6	<i>Give priority to the reuse of previously developed sites where appropriate.</i>	The turbine makes productive use of a small un-productive area of the current Maltings plant and would appear as part of the existing industrial complex.
Aim 5, p6	<i>Promote environmentally sustainable use of existing and planned infrastructure and service capacity to support and facilitate development.</i>	
<b>Policy S1: Development Boundaries</b>	<p><i>‘(a) Within development boundaries proposals for new development on sites not allocated on Proposals Maps will generally be supported where they are in accordance with the relevant policies of the Local Plan.</i></p> <p><i>(c) Development proposals on sites contiguous with a development boundary will only be acceptable where there is a proven public interest and social, economic or environmental considerations confirm there is an overriding need for the development which cannot be met within the development boundary.’</i></p>	The turbine would be located within an area designated as, ‘Employment land’ on the ALPR Arbroath proposals map. The crane hardstanding and turning bell would be located on adjacent the land to the west of the existing Elliot Industrial Estate, as discussed in Policy A11 below.
<b>Policy S3: Design Quality</b>	<p><i>A high quality of design is encouraged in all development proposals. In considering proposals the following factors will be taken into account:</i></p> <ul style="list-style-type: none"> <li>• <i>site location and how the development fits with the local landscape character and pattern of development;</i></li> </ul>	This aspect of the development has been considered in detail in <b>Sections 5 and 7</b> of the ER. The wind turbine would sit alongside the existing industrial buildings and infrastructure in the Elliot area, which would minimise its visual impact when compared to a turbine on a greenfield site. The tall structures in the

	<ul style="list-style-type: none"> <li>• <i>proposed site layout and the scale, massing, height, proportions and density of the development including consideration of the relationship with the existing character of the surrounding area and neighbouring buildings;</i></li> <li>• <i>use of materials, textures and colours that are sensitive to the surrounding area; and the incorporation of key views into and out of the development.</i></li> </ul>	area, such as the telecommunications mast to the east, and the grain drying chimneys are of a similar scale to the turbine, which when constructed would add another functional element to the Maltings plant.
<b>Policy S4 : Environmental Protection, p12</b>	<i>Where development proposals raise issues under environmental protection regimes, developers will require to demonstrate that any environmental protection matter relating to the site or the development has been fully evaluated. This will be considered alongside planning matters to ensure the proposal would not unacceptably affect the amenity of the neighbourhood.</i>	The Environmental Impact of the development has been fully considered within the ER, the main aspects of importance being visual impact, and impacts on residential amenity such as noise and shadow flicker. The ER concludes that the primary impacts will be visual impacts on the local area, which should be considered against the wider economic and environmental benefits of the scheme.
<b>Policy SC16 : Employment Land Supply</b>	<p><i>Angus Council will maintain a supply of employment land to which proposals for business and industry will be directed as follows:</i></p> <ul style="list-style-type: none"> <li>• <i>Arbroath, Elliot and Kirkton, (minimum 10 ha);</i></li> </ul> <p><i>At these locations, and other established employment areas, planning permission will not normally be granted for uses other than Class 4* (business), Class 5* (general industry), and Class 6* (storage and distribution), but may be considered where they are small scale, complementary and ancillary to the existing or proposed use. Development proposals will require to demonstrate there is no detriment to the surrounding amenity.</i></p>	Policy SC16 relates to the existing Elliot Industrial Estate. The turbine would be ancillary and complementary to the existing Class 5 industry at Bairds Malt.
<b>Policy SC36 : Access Rights,</b>	<i>Development proposals, which will result in a significant loss to the public of linear access, area access or access to inland water will be resisted.</i>	The development requires a small diversion to Core Path 152, to ensure that the path does not pass within 80m ('toppling distance') of the wind turbine. No linear access will be lost as a result of the project.
<b>Policy ER5 : Conservation of Landscape Character</b>	<p><i>Development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:</i></p> <p><i>(a) sites selected should be capable of</i></p>	A full Landscape Character Assessment (including a Townscape Assessment) has been provided in Section 7 of the ER. This concludes that overall there will be a low level of impact on landscape, with the turbine being incorporated into an area

	<p><i>absorbing the proposed development to ensure that it fits into the landscape;</i></p> <p><i>(b) where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;</i></p> <p><i>(c) new buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;</i></p> <p><i>(d) priority should be given to locating new development in towns, villages or building groups in preference to isolated development.</i></p>	already defined by industrial structures.
<b>Policy ER33 : Energy Efficiency</b>	<p><i>Angus Council will encourage energy efficiency through the promotion of:</i></p> <ul style="list-style-type: none"> <li>• <i>renewable energy generation and energy efficient systems in domestic and commercial buildings where appropriate, which reduce demand for power from non-renewable sources.</i></li> </ul>	The wind turbine will supply around 20% of the Malting's annual energy demand, significantly reducing the need to import electricity from the grid.
<b>Policy ER34 : Renewable Energy Developments</b>	<p><i>Proposals for all forms of renewable energy development will be supported in principle and will be assessed against the following criteria:</i></p> <p><i>(a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;</i></p> <p><i>(b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;</i></p> <p><i>(c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;</i></p> <p><i>(d) no unacceptable environmental effects of transmission lines, within and beyond the site; and</i></p> <p><i>(e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent and significant change to the environment and landscape.'</i></p>	<p>All of the elements set out in Policy ER34 have been assessed within the ER. The main impacts found relate to visual affects at the nearest properties and residential areas. These visual impacts are balanced by the environmental, social and economic benefits of the scheme.</p> <p>No significant impacts are predicted in terms of:</p> <ul style="list-style-type: none"> <li>• Landscape character;</li> <li>• Cultural Heritage</li> <li>• Natural Heritage</li> <li>• Transmission lines</li> <li>• Traffic / Access</li> </ul>
<b>Policy ER35 : Wind Energy Development</b>	<p><i>Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:</i></p> <p><i>(a) the reasons for site selection;</i></p> <p><i>(b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to</i></p>	<p>a) <b>Section 5</b> of the ER sets out the design process that determined the turbine location and scale. This demonstrates that the chosen location and turbine type are the optimum on the Bairds Malt site.</p> <p>b) <b>Section 6</b> of the ER demonstrates that there will be no unacceptable impact on birds.</p>



	<p><i>disturbance, displacement or collision;</i></p> <p><i>(c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;</i></p> <p><i>(d) that no wind turbines will interfere with authorised aircraft activity;</i></p> <p><i>(e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;</i></p> <p><i>(f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;</i></p> <p><i>(g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.</i></p>	<p>c) <b>Section 7</b> of the ER contains a detailed residential and townscape assessment. This predicts Major or Major / Moderate effects at seven receptors within 1km. The noise and shadow flicker assessments in Section 8 and 12 show that no significant impacts on residential properties are expected.</p> <p>d) The turbine is expected to be visible to the radar at RAF Leuchars. It is the intention of the applicant to seek to agree a planning condition with the MoD on the basis that an in-fill radar solution is provided as part of the development.</p> <p>e) All of the companies with communication links in the area have been contacted, and all are content that the development will not interfere with these assets.</p> <p>f) Cumulative impact is not assessed as being a major issue for the Bairds Malt turbine, as there are few projects which can interact with the proposed development.</p> <p>g) The turbine would be removed from site after the agreed period of operation. A suitable legal agreement confirming this arrangement will be reached with Angus Council should this be required.</p>
<b>A11 : Working - West of Elliot Industrial Estate</b>	<p><i>21 ha of land to the west of the existing Elliot Industrial Estate is allocated for Class 4* (business), Class 5* (general industry), and Class 6* (storage and distribution) uses. Development proposals which would prejudice the expansion of employment land to the west of the existing Elliot Industrial Estate will not accord with this Local Plan.</i></p> <p><i>*As defined in the Town and Country Planning (Use Classes) (Scotland) Order 1997.</i></p>	<p>Discussions have taken place with Angus Council's Economic Development team. The proposed turbine does not preclude the expansion of the Elliot Industrial Estate on land to the west.</p>
<b>A19 : Hospitalfield House</b>	<p><i>Hospitalfield House and grounds will be protected from development that would be detrimental to the historic character and landscape setting of the property.</i></p>	<p>As discussed with Historic Scotland, a full assessment has been made of the impact of the development on Hospitalfield House. This concludes that there would be no significant effects on the historic character or landscape setting of the property.</p>

The Local Plan contains a specific section on Arbroath, aiming to “*maintain the focus on the regeneration of brownfield and opportunity sites within the built up area... this includes identifying and safeguarding future employment land at Elliot*” (p8).

The Plan also states that, “Diversification of the economy and regeneration of the town



continues to be a priority. While inward investment has introduced new businesses, Arbroath's traditional manufacturing sector has continued to contract". (p110)

The plan elaborates on Policy A11 (the proposed extension to the Elliot Industrial Estate), stating that, *"An area west of the existing industrial estate at Elliot provides the opportunity to take advantage of the upgrading of the A92 road and to extend the range and quantity of the long-term employment land supply in Arbroath. Development proposals which would prejudice the expansion of employment land to the west of the existing Elliot Industrial Estate will not accord with this Local Plan. Brownfield sites within Arbroath that are well related to the town centre and transport links provide the potential for reuse for more specialised needs such as office or business use"*.

*The Local Plan will resist development proposals that would prejudice the future expansion of the Elliot Industrial Estate to the west, to ensure this site can be developed as the need arises (p38).*

### **Tayside Landscape Character Assessment (TLCA)**

The TLCA, published in 1999, identifies that the application site falls on the edge of the urban area of Arbroath, which is not considered in detail within the TLCA.

It is adjacent to the **Dipslope Farmland Landscape Character Type (LCT)**, which extends over a large area from the Montrose Basin south-westwards as far as the countryside north of Dundee adjoining the Sidlaw Hills. Its key characteristics are its general slope from north-west to south-east; the dominance of productive agricultural land; low woodland cover, except on large estates and along river corridors; a variety of historic sites; and the limited visual impact of Dundee and Arbroath. The landscape is described as being of medium scale, semi-enclosed to open, with extensive arable production on very fertile land, medium to large fields and a scattered settlement pattern of hamlets and farmsteads.

### **Angus Windfarms Landscape Capacity and Cumulative Impacts Study (AWLCCIS)**

The Study, published in September 2008, provides further information on the characteristics and capacity of the Dipslope Farmland LCT.

The Study suggests that *"the area is considered to have a medium landscape value. Together with a medium sensitivity this gives an **overall medium capacity for windfarm development**. Large or medium windfarms would not be appropriate in this area due to scale and visual sensitivity limitations. Any proposed development should be of limited scale and extent, reflecting the scale and pattern of the local landscape and would be limited by proximity of the settlements and scattered residential population"*.

The study defines a small/medium windfarm as *"A windfarm of more than three turbines up to 20MW output, the examples given being four turbines of over 50m, ten turbines of 2MW power or six turbines of 3MW power"*.

2MW turbines are typically 100m in height, and 3MW turbines around 125m in height. Set against these criteria, the proposed Bairds Malt development, with a single turbine of 77m

in height, would not be considered a large enough development to be a small/medium scale windfarm, and would fall below this threshold.

### **Angus Council Renewable Energy Implementation Guide**

The Guide, which was approved on 14 June 2012, seeks to clarify existing development plan policy and to assist in considering proposals against those policies. The Guide describes the existing character of the Dipslope Farmland as a ‘*Landscape with Views of Windfarms*’, and states that the Acceptable Character in a future scenario would be for a ‘*Landscape with Occasional Windfarms*’, described as:

- *A landscape type or area in which windfarms or wind turbines are located or are very close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape’s character; and*
- *Visual receptors would experience occasional close-quarters views of a windfarm or turbines and more frequent background views of windfarms or turbines. Some turbines may or may not be perceived as being located in the landscape character area. No overall perception of windfarms being a defining feature of the landscape.*

The guide states that the LCT is ‘Considered to have scope for turbines circa 80m in height’.

### **Strategic Landscape Capacity Assessment of Wind Energy in Angus (November 2013)**

The most recent guidance on landscape capacity is provided by the ‘*Strategic Landscape Capacity Assessment (SLCA) for Wind Energy in Angus November 2013*’. This provides specific guidance on each Landscape Character Type within the Local Authority Area, and assesses the acceptable future level of change within each area. The Bairds Malt site is fully situated within the Urban area of Arbroath, however, it neighbours the ‘Letham, Lunan Water and Arbroath Valleys’ sub-section of the ‘Dipslope Farmland’ character type which is described as:

*“Letham, Lunan Water and Arbroath Valleys: This sub-area surrounds watercourses that drain to the sea at Lunan Bay and Arbroath. It is generally lower and/or less open and exposed than neighbouring sub areas and has more settlement, including the significant settlements of Arbroath, Letham and Friockheim as well as smaller hamlets, isolated farms and houses. A golf/housing resort is identified in the local plan at Letham Grange near Arbroath. The land is intensively farmed, including area of polytunnels. There are significant areas of mature trees: within designed landscapes such as Guthrie and Pitmuies, along watercourses and around settlements. Roads follow the valley landforms. An electricity transmission line lies near Arbroath. Due to its more enclosed and settled character, the sub-area would be more sensitive to wind energy developments”*

The SLCA states that this landscape character area would be suitable for development of small numbers of turbines up to 50m in height. The guide states that there is no capacity for larger development within this landscape character area.

The SLCA does not provide any guidance for development within the urban areas or the urban fringes around the local settlements. The proposed location for this development is within the industrialised area to the south-west of the settlement of Arbroath. The character of this area is considered in detail within **Section 7** of the Environmental Report, and a full townscape assessment has been undertaken. The area immediately around the site is characterised by the industrial estate, with the turbine location adjacent to a number of large scale industrial units and warehouses which comprise the Maltings workings and the wider industrial estate. The landcover is predominantly concrete and the existing buildings are a variety of style and finishes, primarily clad in concrete or metal which adds to the industrial feel of the area.

The townscape assessment considers the impact of the turbine on this immediate area, as well as on the other townscapes within Arbroath.

### **3.3 Conclusion**

The proposed wind turbine is an important element in consolidating and strengthening one of the largest manufacturing businesses and employers within Arbroath, that operates in a sector which the Local Plan notes has seen contraction in recent years. The turbine makes productive use of the available land on the existing Bairds Malt site, and although occupying a small area of the land earmarked for westward expansion of the Elliot Industrial Estate, will not greatly affect its potential for future development.

The turbine would be viewed within the current industrial setting of the area, appearing alongside tall vertical elements such as the grain drying towers and large structures of the Maltings Plant. The main impacts upon local amenity will be visual impacts upon the nearest residential receptors, which currently have views of the Maltings site.

The turbine would contribute a small amount to renewable energy targets, but more significantly would supply around 20% of the high electricity demand for the Maltings Plant. This is firmly in line with the Scottish Government's aspirations concerning local renewable energy ownership and use, with the turbine directly supplying electricity to a company with strong local connections and suppliers throughout the region.

The proposed development at Bairds Malt is therefore deemed to comply with national, regional and local policies relating to wind energy. The remainder of this report assesses the proposed development in more detail, looking at the site specific aspects of the proposal.

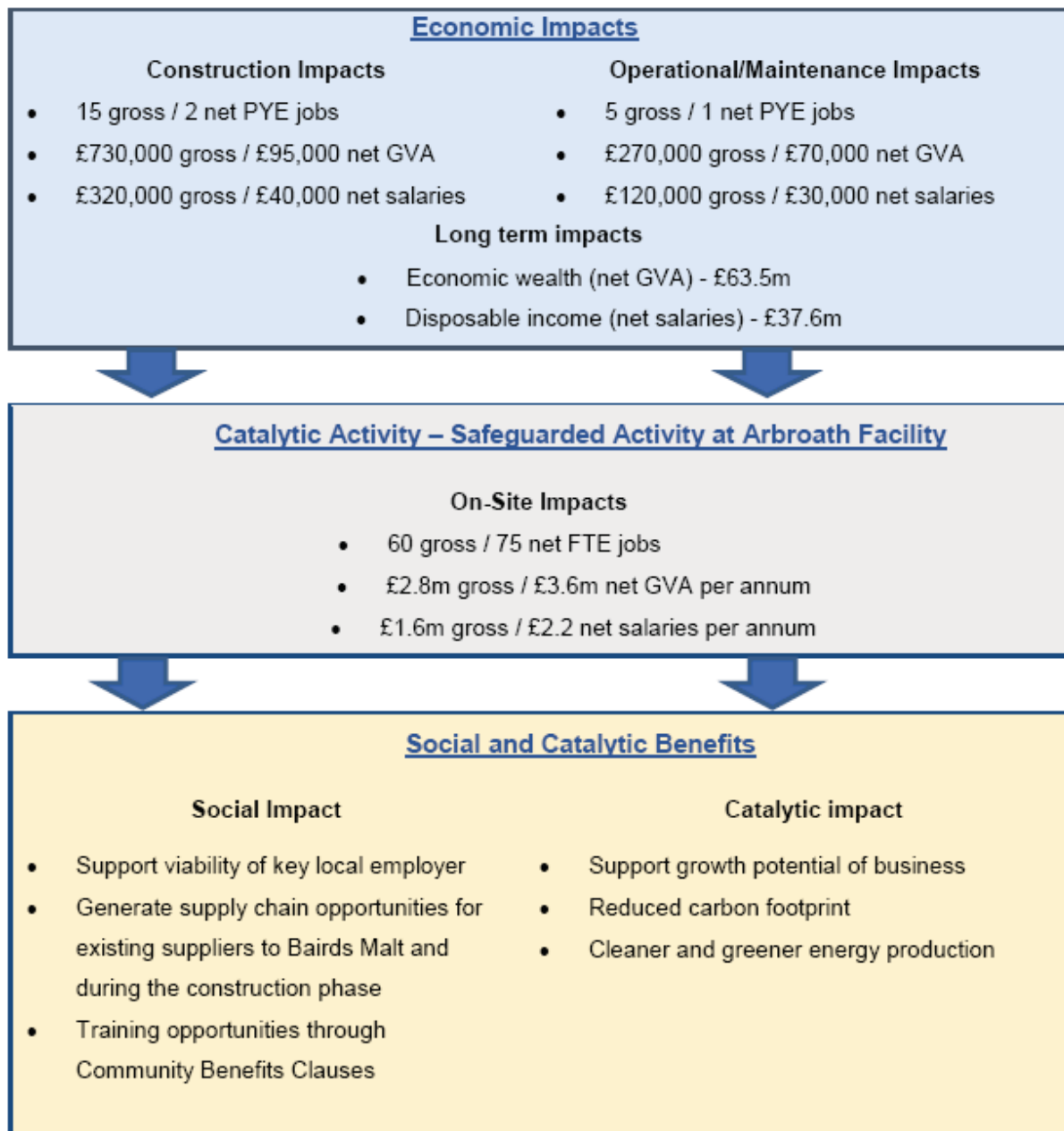
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## 4 Local Economic Benefits

A detailed Socio-Economic Assessment has been completed that quantifies the expected benefits of the scheme. This is included as **Appendix 6**. A summary of the impacts and benefits is provided below.



## 5 Project Design Considerations

### 5.1 Turbine Type

The first consideration was to identify the size of the turbine that would be suitable for the site. The overall aim was to install a turbine that could supply a significant portion of the Malt's electricity demand whilst meeting technical and environmental constraints. A larger turbine would have a higher electrical output, but would also have a higher visual impact and would require more space on site.

The annual electricity demand of the Maltings is 10GWh per year, which is more than the equivalent annual output of a 3MW turbine, which would be in the region of 126m in height and with an 82m rotor diameter, similar in scale to those in operation at the Michelin Plant in Dundee which are 120m to tip height. No single turbine would therefore be able to satisfy all of the current electrical demand for the Maltings, so the aim was supply as high a proportion as possible.

The smallest turbine possible on the site is dictated by the vertical constraints of the site. Sufficient clearance needs to be allowed between the lowest height of the blade sweep and the buildings throughout the site, the tallest of which are the grain drying towers which are 27m in height.

**Table 5.1** shows the different turbine options that were considered on site.

**Table 5.1 – Turbine options**

Turbine model	Hub Height	Rotor Diameter	Tip Height	Blade sweep minimum height	Rated capacity	% of annual Maltings demand <sup>1</sup>
E82	85m	82m	126m	44m	3MW	76%
E70	65m	70m	100m	30m	2.3MW	58%
E53	60m	53m	87m	33.5m	800kW	20%
E44	55m	44m	77m	33m	900kW	23%

The decision was made to proceed with the **Enercon E44**, which has the lowest tip height of all of the turbines that were considered. This was assessed as providing the best balance between energy production and visual impact, whilst also satisfying the necessary clearance height from the Maltings buildings. Another aspect of the E44 is that it has the smallest rotor diameter of the turbines considered which would further reduce its visual impact. An added advantage of Enercon turbines is that the generators are directly driven, without the need for a separate gearbox. This makes them amongst the quietest turbines in their respective classes.

**Figure 5.1** demonstrates that the proposed Bairds turbine is much smaller than those in operation at the Michelin Plant in Dundee and those previously proposed at GSK in

<sup>1</sup> Based upon the UK onshore wind average capacity factor of 28.9%. Digest of UK Energy Statistics 2013 (DUKES) Table 6.5 - Load factors for renewable electricity generation, November 2013

Montrose. The E44's smaller rotor diameter means that it occupies a smaller portion of the horizontal extent of views.



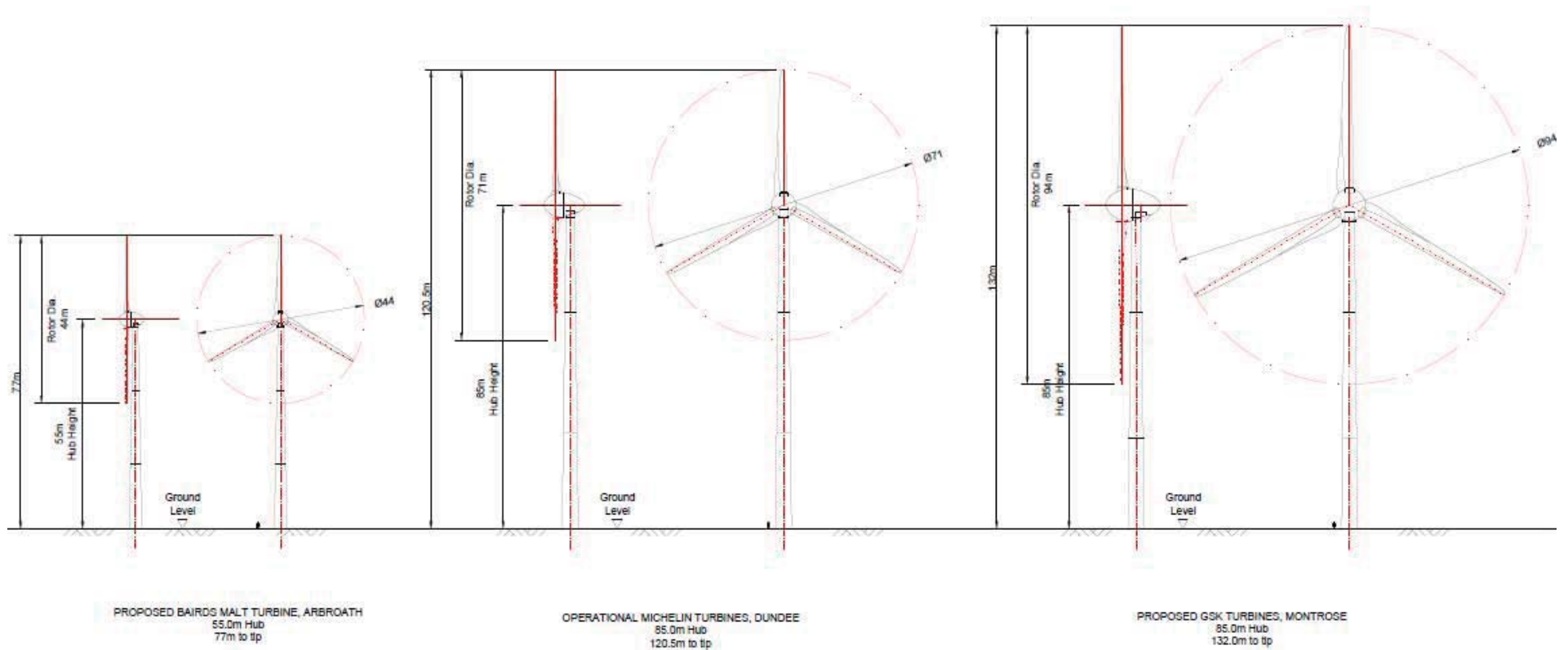


Figure 5.1– Comparison between the proposed Bairds Malt turbine, the Michelin Dundee turbines and the proposed GSK turbines at Montrose

## 5.2 Turbine Location

Having identified the preferred turbine, the next step was to identify the best location on the site. The key considerations when locating the turbine were to:

- Ensure that sufficient space was available for the turbine, access track and crane pad;
- Ensure that the current operation of the Malt could continue with as little disruption as possible during construction and operation of the turbine;
- Ensure that the construction area could be accessed by the Turbine Delivery Vehicles and Crane;
- Ensure that the 22m turbine blades would not overhang any 3<sup>rd</sup> party land; and
- Maximise as far as possible the distances from residential receptors such as those located in the residential area containing Patrick Allen-Fraser Street, and stand-alone properties such as Peasiehill Farm Cottages;

When assessing the options a turbine located in the south-eastern corner of the site seemed the obvious choice. This location is the furthest possible distance from residential receptors to the north, and was in an area that was clear of any existing site infrastructure. A turbine located here would also not interfere with the Malt's operations.

It was identified at an early stage that the crane pad and the termination of the access track / turning bell could not be accommodated in the space available, and a third-party land agreement would need to be secured to allow these to be located in fields to the south-west of the turbine. It was also identified that Core Path 152 that runs alongside the Malt's boundary between the West Sands and Peasiehill would need to be diverted to skirt the proposed project infrastructure.

Agreement was reached with the third-party landowner, and a separation distance of 77m between the turbine location and diverted Core Path has been incorporated into the final design. **APP-001** presents the final project layout.

### Access

Access to this area of the site is straight forward. The turbine components and construction traffic would enter the Bairds site via an existing gate to the north-west of Silo 2, and then proceed along the western edge of Silo 2 to reach the construction area.

### Malt Operations

The proposed turbine and infrastructure would have a minimal impact on existing Malt operations. The existing arrival and exit routes used by lorries to unload grain can continue to be used, although there will be some temporary disruption during the construction phase.

### **5.3 Main Environmental Considerations**

#### **Ecology**

As a working industrial complex with no running water on site, the potential impacts on wildlife are extremely limited, and no protected species or habitats are expected to be affected by the development. A discussion of the predicted ecological impacts of the development is presented in **Section 6**.

#### **Landscape and Visual Impact**

The final turbine location maximises the available distance between residential areas and the nearest individual properties. The visual impact of the turbine is nevertheless an important consideration in the planning process. A detailed Landscape and Visual Impact Assessment (LVIA) is presented in **Section 7**.

#### **Noise**

A full picture of existing background noise levels and predicted turbine noise levels has been built up at different times throughout the day and night. In consultation with Angus Council, noise constraints, in line with the ETSU-R97 Guidelines, have been established for the nearest noise sensitive receptors to the proposed turbine. The proposed turbine has been designed to meet these constraints and on this basis, noise from the turbine is not expected to have an unacceptable or adverse impact on any nearby properties. This noise assessment is presented in full in **Section 8**.

#### **Shadow Flicker**

A full assessment of the potential for shadow flicker from the proposed turbine at residential, commercial and industrial receptors is presented in **Section 11**. The results show that there is not expected to be an un-acceptable impact at nearby residential and commercial properties.

## 6 Ecology and Ornithology

### 6.1 Introduction

GLM Ecology, an established consultancy with extensive experience of ecological work at wind farm sites, was commissioned to carry out a Protected Species Survey of the Bairds Malt site. The aim was to highlight potential ecological constraints and to provide an assessment of the potential for impacts on protected species and habitats.

This section summarises the findings of this assessment. The full Protected Species Report is included as **Appendix 1**. Its confidential nature means that it is not publicly available.

### 6.2 Methodology

The assessment consisted of a desktop data study combined with an initial site visit. The desktop study utilised the following resources to identify the presence of any protected species present within the 10km grid square encompassing the survey site:

- NBN Gateway;
- RSPB sensitivity maps;
- Scottish Natural Heritage (SNH) Sitelink;
- Scottish Raptor Group; and
- Multi Agency Geographic Information for the Countryside (MAGIC).

To support the desktop study a field survey was carried out in May 2012 in good weather conditions.

### 6.3 Results

The following ecological sites of interest were identified in the area around the Bairds Malt site.

**Table 6.1 – Ecological sites within a 20km radius**

Ecological feature	Zone of impact from site boundary	Sites
Internationally designated sites (SPA, SAC, Ramsar)	Within 20km	Montrose SPA – designated for non-breeding assemblage of waterfowl and pink-footed goose. Firth of Tay and Eden Estuary SPA - designated for non-breeding assemblage of waterfowl and pink-footed goose.
■ Nationally designated sites (SSSI, NNR)	Within 5km	Elliot Links SSSI– Designated for sand dunes.
■ Locally designated sites (LNR, WS)	Within 1km	None

### Ornithology

The desktop study and the site visit concluded that given the small size of the site, its industrial habitat, and the lack of suitable breeding and foraging habitat for birds the proposed development would have a negligible significance of impact on any breeding, migratory or over wintering species.

### Habitats and Mammals

As an industrial site with no running water, no suitable habitat exists on site for any protected flora, mammals, amphibians or reptiles, with the exception of bats.

### Bats

The site visit identified that the Bairds buildings could be potentially suitable for bat roosts, and so an initial bat survey was recommended to identify whether bats were present on site.

This survey was undertaken in May 2012 in accordance with guidance from the Bat Conservation Trust and Natural England. This comprised of two elements:

1. A Habitat Survey to identify potential flight lines/commuting routes, roosts and foraging areas and the overall suitability of the site for bats. Any potential foraging areas were examined and linear features were assessed for their suitability as flight lines or commuting pathways.
2. Bat detector surveys in which dusk and dawn transect surveys were undertaken. A SM2 static bat recorder was also positioned for five nights adjacent to the turbine location.

No bats were recorded on either the bat detector survey or on the static bat recorder.

## **6.4 Summary and Conclusion**

Survey work was completed across the site and the immediately surrounding area, following best practice and industry guidance to identify the species and habitats present.

No suitable breeding or foraging habitat exists for badger, otter, water vole or protected bird species. Bat surveys were carried out following BCT guidelines and no bats were recorded.

It is considered unlikely that the development will have any long-term impact on the integrity of the area's ornithological features or the conservation status of the species found here.

It is also considered that the integrity of qualifying species and habitats for the identified designated sites (Montrose and Firth of Tay SPAs and Elliot Links SSSI) would not be impacted upon.

## 7 Landscape and Visual Impact

### 7.1 Introduction

This section reports on the potential landscape and visual effects of the proposed Bairds Malt Wind Turbine.

The aim of the design and assessment process is to promote the best “environmental fit” for the development through consideration of the existing landscape resource, the potential landscape and visual effects and design alternatives. This assessment process will refer to landscape value, and in particular landscape designations and related planning policy, as well as landscape character and the capacity for wind turbine development at this site. Included as part of this chapter are accompanying figures, illustrating potential visibility and, photomontaged examples from a range of receptors, descriptions of which can be found in **Bairds Malt Wind Turbine Landscape Figures** which accompany the Environmental Report.

### Summary of Scope

The scope of the assessment, as shown in **Table 7.1**, has been established on the basis of professional judgement and through the consultation process. A meeting was held with Angus Council on the 13<sup>th</sup> December 2012 to agree the scope of the Landscape & Visual Assessment.

**Table 7.1 - Scope of the Landscape and Visual Assessment**

<b>Landscape Issues</b>	<b>Description</b>
Landscape Character	The effects of the proposed development on the landscape character and quality of the site area, as defined by the <i>Tayside Landscape Character Assessment</i> and site survey.
Landscape Elements	Direct or physical effects on landscape elements.
Landscape Designations	Views from Areas of Great Landscape Value, National Scenic Areas and Gardens and Designed Landscapes as well as views from other areas of landscape character as perceived by people
<b>Visual Issues</b>	<b>Description</b>
Local Community	Views from local communities, particularly from residential properties near the site and from local settlements which lie within the ZTV. Views from roads and popular tourist / walker destinations and hilltops will also be taken into consideration.
Tourist Destinations	Views from popular outdoor tourist destinations which entail an appreciation of the landscape, where the setting of landscape features provide the visitor experience.
Major Transport Routes	Transport routes including the A92 and the minor road between Arbroath and Forfar.
<b>Cumulative Issues</b>	<b>Description</b>
Cumulative Assessment	The cumulative assessment includes viewpoint assessment within the Study Area where simultaneous and/or successive views of more than one wind energy development may be achieved, and sequential cumulative assessment, where more than one wind energy development may be viewed along transport routes (simultaneous or successive).

## 7.2 Guidance

The methodology for the landscape and visual impact assessment (LVIA) and the cumulative landscape and visual assessment (CLVIA) has been undertaken in accordance with the methodology set out below and conforms with *The Guidelines for Landscape and Visual Impact Assessment*, Second Edition (Landscape Institute and IEMA, 2002).

Additional guidance has been taken from the following publications:

- *The Tayside Landscape Character Assessment*, Land Use Consultants, 1999;
- *Fife Landscape Character Assessment*, David Tyldesley and Associates, 1999;
- *South and Central Aberdeenshire Landscape Character Assessment*, Environmental Resources Management, 1998;
- *Implementation Guide for Renewable Energy Proposals*, Angus Council, June 2012;
- *Siting and Designing Windfarms in the Landscape*, Scottish Natural Heritage, Version 1, December 2009;
- *Visual Representation of Windfarms Good Practice Guidance*, prepared by Horner + Maclennan and Envision for Scottish Natural Heritage, The Scottish Renewables Forum and the Scottish Society of Directors of Planning, March 2007
- *Landscape Character Assessment: Guidance for England and Scotland* (Countryside Agency and Scottish Natural Heritage publication, produced by the University of Sheffield and Landuse Consultants), 2002;
- *Guidance: Cumulative Impacts of Onshore Wind Developments*, Scottish Natural Heritage Advisory Service, Version 3, March 2012;
- *Landscape Character Assessment Topic Paper 6 - Techniques and Criteria for Judging Capacity and Sensitivity*, Countryside Agency and Scottish Natural Heritage, 2004;
- *Photography and Photomontage in Landscape and Visual Assessment*, Landscape Institute Advice Note 01/2011, 2011.



### 7.3 Assessment Methodology

#### Defining the Study Area

An overall Study Area of 35km radius from the site centre has been established following consultation with Angus Council. This is as specified in the Council's Implementation Guide. The study area was further defined for each part of the assessment process as follows:

**Landscape and Visual Impact Assessment (LVIA)** – the study area was restricted to the application site, access routes, and the potential Zone of Theoretical Visibility (ZTV) from where there may be a view of the development at up to 35km distance from the site centre. The main focus of the assessment has been the area within 10km as this would be the distance within which effects of the proposed development are most likely to be experienced. This has been informed with reference to the findings of field surveys and viewpoint analysis, as well as from professional experience from previous assessments.

**Cumulative Landscape and Visual Impact Assessment (CLVIA)** - considers existing wind energy development proposals that have permissions, and those that are currently the subject of undetermined applications within a search area of 60km radius of the site centre. An initial assessment of the cumulative visibility of these wind farms within the Cumulative Search Area was then undertaken in order to determine which have the potential to contribute to a significant cumulative effect following addition of the Bairds Malt Wind Turbine. Many of these developments were scoped out of the assessment at this stage due to the lack of combined visibility or long distance from the proposed site such that they would not contribute to significant cumulative effects. The detailed assessment, therefore, focuses on those sites with potential for significant cumulative effects in combination with the Bairds Malt Wind Turbine. These wind farms are considered to be those within a 10-15km radius from the site, as presented in **Figures 7.6a, b and c**.

**A Zone of Theoretical Visibility (ZTV)** was created using the ReSoft © WindFarm computer software to identify areas that have potential visibility of any part of the proposed wind turbine's blade tip and hub-height. The ZTV however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits of the visual assessment study area. This is particularly relevant to visibility within the Arbroath urban area.

**Figure 7.4** illustrates the ZTV to a hub height of 55m at 1:250,000 scale. **Figure 7.5** illustrates the ZTV to a tip height of 77m at this scale. **Figure 7.6** illustrates the ZTV segments to blade tip at a more detailed scale.

#### Baseline Landscape and Visual Resource

This part of the LVIA refers to the existing landscape character, quality or condition and value of the landscape and landscape elements on the site and within the surrounding area, as well as general trends in landscape change across the study area. A brief description of the existing landscape character and land use of the area which includes reference to settlements, transport routes, vegetation cover, as well as landscape planning designations, local landmarks, and tourist destinations.

### Assessing Landscape Effects

Landscape Effects are defined by the Landscape Institute as “*changes to landscape elements, characteristics, character, and qualities of the landscape as a result of development*”. The potential landscape effects, occurring during the construction and operation period, may therefore include, but are not restricted to, the following:

- Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character type;
- Changes to landscape quality: degradation or erosion of landscape elements and patterns, particularly those that form characteristic elements of landscape character types;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and
- Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

The development may have a direct (physical) effect on the landscape as well as an indirect effect or effect perceived from out with the landscape character area. Landscape effects are assessed by considering the sensitivity of the landscape against the degree of change posed by the development. The sensitivity of the landscape to a particular development is based on factors such as its quality and value and is defined as high, medium or low. Examples of landscape sensitivity and criteria are described below:

**High Sensitivity** – This would primarily be rare landscapes, or landscapes which have been afforded either a national or local designation such as National Parks, National Scenic Areas or Areas of Great Landscape Value. These landscapes can be fairly dramatic in terms of scale and may feature a number of attractive landscape features, including mature woodland, intricate gorges and river valleys, prominent summits or features of cultural heritage. Man-made features or modifications to the landscape will be minimal and the landscape may have a wild or remote feeling to it;

**Medium Sensitivity** – This would include landscapes which are still relatively attractive and generally rural but do contain some man-made elements. It may be landscapes which have been modified to accommodate farming practices and landscapes which include more prominent settlement pattern and road networks. These landscapes may also contain woodland including plantation forestry and shelterbelts; and

**Low Sensitivity** – This would only be reserved for landscapes which may be deemed unattractive due to heavy modification and prominent man-made features, such as industrial units.

The magnitude or degree of change considers the scale and extent of the proposed development, which may include the loss or addition of particular features, and changes to landscape quality, and character. Magnitude can be defined as high, medium, low or negligible, examples of magnitude are shown below:

**High Magnitude** – This would be a major change to baseline conditions, where the character of the landscape may be altered from its existing state into a landscape with wind farms;

**Medium Magnitude** – This would be a noticeable change in the baseline condition but not necessarily one which would be enough to alter the character of the landscape and will generally diminish with distance;

**Low Magnitude** – This would be a minor change to the baseline conditions where the development would be readily missed by a casual viewer and any character of the landscape would remain intact; and

**Negligible Magnitude** – This would be a change which would be difficult to notice and the baseline conditions are likely to remain almost as they were.

The level of effect is determined by the combination of sensitivity and magnitude of change as shown in **Table 7.2**.

**Table 7.2 - Magnitude and Sensitivity Matrix for assessing Overall Level of Effect**

Sensitivity	Magnitude of Change			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible

### Assessing Visual Effects

Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the development on views, and the general visual amenity. The visual effects are identified for different receptors (people) who will experience the view at their places of residence, during recreational activities, at work, or when travelling through the area. These may include:

- Visual effect: a change to an existing view, views or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect. Either:
  - Simultaneously - where a number of developments may be viewed from a single fixed viewpoint simultaneously within the viewer's field of view without moving;

- Successively - where a number of developments may be viewed from a single viewpoint successively by turning around at a viewpoint, to view in other directions; and
- Sequentially - where a number of developments may be viewed sequentially or repeatedly from a range of locations when travelling along a route.

The general principles adopted for the assessment of visual effects were taken from *The Guidelines for Landscape and Visual Impact Assessment* Second Edition, produced by the Landscape Institute, 2002. This guidance outlines the approach to define a 'sensitivity' for a given view and a 'magnitude of change' that would be caused by the development in question over its lifetime. A matrix in the Guidance is then used to assess the overall 'level of effect'. This matrix is the same format as used to understand landscape effects and can be seen in **Table 7.2**. Examples of visual sensitivity are highlighted below:

**High Sensitivity** – These include residential receptors, such as views from individual properties or views from within settlements. Views from both recreational locations, such as hill summits, long distance footpaths, cycle paths and tourist locations such as castles and visitor centres are also considered to be of high sensitivity;

**Medium Sensitivity** – This would include most other visual receptors such as views from roads, other areas of landscape which would not be classed as recreational areas and views from areas within settlements which would not be considered residential; and

**Low Sensitivity** – This would cover views experienced by people at work and views where the existing view is already dominated by significant man-made features.

In the context of this project, the effects during operation are always direct and long term (reversible after 25 years). Effects may also be non-cumulative or cumulative. None of the visual effects relating to this project have been considered positive in order to present a worst case view of any effects, although it should be noted that surveys have consistently shown that the majority of people are positively disposed to wind farm development once it is built.

### **Viewpoint Analysis Method**

Viewpoint analysis is used to assist the LVIA from selected viewpoints within the study area. The purpose of this is to assess both the level of visual impact for particular receptors and to help guide the assessment of the overall effect on visual amenity and landscape character. The assessment involves visiting the viewpoint location in good weather and viewing wireframes and photomontages prepared for each viewpoint location. Illustrated turbines always face the viewer to give a worst case impression of the development under consideration. As far as possible the viewpoints have been selected to meet the following criteria:

- A balance of viewpoints to the north, south, east and west;
- A range of near middle and distance views of the development;
- A proportion representing areas known locally where people use the landscape, such as prominent hill tops or footpaths; and
- A proportion representing designated areas.

A wide range of viewpoints have been studied as part of this assessment and 10 viewpoints have been illustrated with photomontages to assist the assessment for the proposed development. **Table 7.3** below provides a summary of the viewpoint locations and rationale for their selection.

**Table 7.3 - Summary of locations selected for Viewpoint Assessment**

Viewpoint	Reason for Initial Selection	Distance
1. Queens Drive	Located at the side of the A92 to the south-east of the proposed turbine. The view was chosen to represent the waterfront area and road users leaving the settlement of Arbroath	1.4km
2. Elliot Bridge	Located by a small cluster of properties to the south of the proposed turbine. The view was chosen to represent local residents.	700m
3. Arbirlot Road West	The viewpoint is located at the side of the Arbirlot Road West to the north-west of the proposed development. The view was selected to represent local residents of Hospitalfield and local road users.	1km
4. Boulzie Hill	Located near the summit of Boulzie Hill, an area of open space within the settlement of Arbroath, it is popular with local residents and visitors to the town.	2.8km
5. Bearfauld Road	The viewpoint is taken from the side of Bearfauld Road, which forms part of the National Cycle network to the north-east of Arbroath and represents road users, cyclists and local residents	4.2km
6. East Haven	The viewpoint is taken from the side of a local minor road near to East Haven, which forms part of the National Cycle network and represents road users, cyclists and local residents	4.8km
7. A92, Salmonds Muir	The viewpoint is taken from the side of the A92 near Salmonds Muir to the south of Arbroath and represents road users.	4.0km
8. Patrick Allan Fraser Street	The viewpoint is located in the neighbouring housing estate. The viewpoint was selected to represent some of the closest residential receptors of the proposed development	420m
9. Firthfield	The viewpoint is taken from a local road to the north of the proposed development; the viewpoint was chosen to represent road users, primarily local residents of neighbouring farms and steadings	4.1km
10. Braemore	The viewpoint is taken from a local road to the west of the proposed development, the viewpoint was chosen to represent local residents of neighbouring farms and steadings	2.8km
11. A933 Montreathmont	The viewpoint is taken from the A933 to the north of Friockheim. It is representative of road users.	11.5km
12. Dodd Hill	Located at the summit of Dodd Hill on the edge of the Sidlaws. The viewpoint is representative of hill walkers in the area.	16.6km
13. Turin Hill	Located at the summit of Turin Hill. The viewpoint was chosen to represent hill walkers as well as the impact on the hill fort.	17.1km
14. Tentsmuir	Located on the north-eastern coast of Fife. The viewpoint is representative of visitors to the Special Landscape Area, which is popular with walkers, cyclists	19.1km

Viewpoint	Reason for Initial Selection	Distance
	and other users	
15. St Andrews	Located near the coast overlooking the links to the north. The viewpoint was chosen to represent local residents and visitors to St Andrews.	25.5km
16. White Caterthun	Located at the summit of the ancient fort settlement. The viewpoint represents visitors to the white and brown Caterthun forts as well as hill walkers in the area.	26.9km

### Methodology for Production of Visualisations

With the view selected, the locations were confirmed and then photographed with a digital Single Lens Reflex (SLR) camera set to produce photographs equivalent to that of a manual 35 mm SLR camera with a fixed 50 mm focal length lens. In accordance with the SNH guidance *Visual Representation of Windfarms Good Practice Guidance*, panoramic images were produced from these photographs to record a 76° angle of view illustrating the typical extent of view that would be experienced by the viewer at the viewpoint when facing in one direction and also provides an indication of the visual context of the proposed development. The wider 360° of each view were also taken into account, particularly for the hill summit viewpoints.

Each view was illustrated using a panoramic photograph, a wireline and, in some cases, a photomontage. Wirelines and photomontages were produced using Resoft© WindFarm software and utilising 50m<sup>2</sup> Ordnance Survey Digital Terrain Mapping (DTM) height data covering the study area.

The Landscape and Visual Impact Assessment has been undertaken using a candidate turbine, the Enercon E44 with a hub height of 55m and tip height of 77m.

### Visual Assessment of Settlements and Residential Properties

All settlements within the study area have been assessed with regards to the level of visual impact the development will have on them. The sensitivity for each of the settlements is considered to be high in accordance with Guidelines for Landscape and Visual Impact Assessment, 2002.

An assessment of the visual amenity of residential properties within 2km of the wind turbine was undertaken, as set out in Angus Council's guidance and agreed at the Scoping stage. Individual residential properties have been assessed from public roads and footpaths within the area and the assessment represents a 'best estimate' of the likely visual effects. In line with the guidance from the Landscape Institute<sup>2</sup>, the views from upper floor windows are considered to be of lesser importance, but the garden and public areas are included as well as the visual context in which views are experienced. In addition to this all settlements within the study area have been assessed and level of effect noted.

<sup>2</sup> Paragraph 7.30 page 90 in 'Guidelines for Landscape and Visual Impact Assessment. Second Edition.' Landscape Institute and Institute of Environmental Management and Assessment. March 2002.

### **Visual Assessment of Main Transport Routes**

A route assessment has been undertaken which explores the visual impact of the development on views experienced by road users along major transport routes in the area and assumes that the viewer would be travelling at speed.

It also includes assessment of any National Cycle Routes, Long Distance Footpaths and locally valued footpaths which fall within the study area. This part of the assessment has been considered cumulatively along with all other wind energy development within the study area.

### **Cumulative Landscape and Visual Assessment**

In addition to the Landscape Institute methodology for LVIA, the cumulative landscape and visual assessment (CLVIA) has considered the emerging guidance from Scottish Natural Heritage's '*Assessing the Cumulative Impact of Onshore Wind Energy Developments*', Scottish Natural Heritage, March 2012. The CLVIA is however, not a substitute for individual wind development landscape and visual impact assessment.

### **Predicting Cumulative Landscape Effects**

The assessment considers the extent to which the proposed development, in combination with others, may change landscape character through either incremental effect on characteristic elements, landscape patterns and quality, or by the overall cumulative addition of new features. Identified cumulative landscape effects are described in relation to each individual Landscape Character Area and for any designated landscape areas that exist within the study area.

### **Predicting Cumulative Visual Effects**

The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. Cumulative visibility maps are analysed to identify the residential and recreational locations and travel routes where cumulative visual effects on receptors (people) may occur as a result of the proposed development.

With potential receptor locations identified, cumulative effects on individual receptor groups are then explored through viewpoint analysis, which involves site visits informed by wireline illustrations that include other wind developments. Travel routes are driven to assess the visibility of different wind developments and inform the assessment of sequential cumulative effects that may occur along a route or journey.

### **Cumulative Viewpoint Analysis**

Each viewpoint has been assessed cumulatively in order to understand whether or not the proposed development introduces a cumulative impact on the view from that location. All visible operational, consented and undetermined planning application wind energy projects are considered along with the Bairds Malt Wind Turbine development and a level of cumulative magnitude is assigned. The level and significance of cumulative visual effects is determined in the same manner as the main LVIA, using the previous matrix shown in **Table 7.2**.



## 7.4 Landscape Design Considerations

### Project Description

The proposed development comprises the construction of a single turbine in the south-west corner of the Bairds Malt compound. The turbine proposed is 55m in height to hub and up to 77m to blade tip.

### Landscape Design Considerations

In accordance with SNH's *Strategic Locational Guidance for Onshore Wind Farms*, the site location would lie within Zone 1, which is described as follows:

*Zone 1: Lowest natural heritage sensitivity identifies areas at the broad scale with least sensitivity to wind farms, with the greatest opportunity for development, within which overall a large number of developments could be acceptable in natural heritage terms, so long as they are undertaken sensitively and with due regard to cumulative impact.*

However, this assessment is the result of a broad based study and provides an indication only.

### Angus Local Plan Review

The Guide, which was approved in June 2012, seeks to clarify existing development plan policy and to assist in considering proposals against those policies. The Guide describes the existing character of the Dipslope Farmland as a '*Landscape with Views of Windfarms*', and states that the Acceptable Character in a future scenario would be for a '*Landscape with Occasional Windfarms*', described as:

- *A landscape type or area in which windfarms or wind turbines are located or are very close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape's character; and*
- *Visual receptors would experience occasional close-quarters views of a windfarm or turbines and more frequent background views of windfarms or turbines. Some turbines may or may not be perceived as being located in the landscape character area. No overall perception of windfarms being a defining feature of the landscape.*

The guide states that the LCT is 'Considered to have scope for turbines circa 80m in height'.

### Strategic Landscape Capacity Assessment of Wind Energy in Angus (November 2013)

The most recent guidance on landscape capacity is provided by the '*Strategic Landscape Capacity Assessment (SLCA) for Wind Energy in Angus November 2013*'. This provides specific guidance on each Landscape Character Type within the Local Authority Area, and assesses the acceptable future level of change within each area. The Bairds Malt site is fully situated within the Urban area of Arbroath, however, it neighbours the 'Letham, Lunan Water and Arbroath Valleys' sub-section of the 'Dipslope Farmland' character type which is described as:

*“Letham, Lunan Water and Arbroath Valleys: This sub-area surrounds watercourses that drain to the sea at Lunan Bay and Arbroath. It is generally lower and/or less open and exposed than neighbouring sub areas and has more settlement, including the significant settlements of Arbroath, Letham and Friockheim as well as smaller hamlets, isolated farms and houses. A golf/housing resort is identified in the local plan at Letham Grange near Arbroath. The land is intensively farmed, including area of polytunnels. There are significant areas of mature trees: within designed landscapes such as Guthrie and Pitmuies, along watercourses and around settlements. Roads follow the valley landforms. An electricity transmission line lies near Arbroath. Due to its more enclosed and settled character, the sub-area would be more sensitive to wind energy developments”*

The SLCA states that this landscape character area would be suitable for development of small numbers of turbines up to 50m in height. There is no capacity for larger development within this landscape character area.

The SLCA does not provide any guidance for development within the urban areas or the urban fringes around the local settlements. The proposed location for this development is within the industrialised area to the south-west of the settlement of Arbroath, and the turbine has been assessed in this context. The field immediately to the south-west of the Maltings, within which the crane pad hardstanding would be located is zoned for light industrial use within the Local Plan. As discussed in **Section 2**, Angus Council successfully applied for planning permission for an extension of the Peasiehill Industrial Estate into this area.

### **Design Objectives**

The design of the proposed development has been led by the on-site energy demands and the constraints of the existing infrastructure, primarily the Maltings Plant. A detailed description of the site, turbine location and specification and the rationale for these selections as well as construction and decommissioning information are included in **Section 2** and **Section 5** of the Environmental Report.

## **7.5 Baseline Conditions**

Information on the existing landscape and visual resource has been collected by reference to Local Plans, Ordnance Survey maps and relevant literature, including the Tayside Landscape Character Assessment as well as information gathered from field surveys.

### **Broad Landscape Context**

The study area for the proposed development is located within the Tayside Landscape Character Assessment. Located on the south-western fringes of the settlement of Arbroath, the landscape has a fairly urban feel, although outwith the settlement to the west and north the landscape quickly changes to a more rural character with large sprawling fields covering the majority of the landscape interspersed with areas of woodland and shelterbelts. To the east the coast has a significant influence and is visible over large sections of the main coastal transport corridor, the A92, which runs between Dundee and Arbroath. **Figure 7.2** illustrates

the various landscape characters types, which have been classified by Scottish Natural Heritage and their consultant landscape architects. It can be seen from **Figure 7.2** that the site study area is covered by three different area reports; Tayside, South and Central Aberdeenshire and Fife.

The proposed development site is adjacent to the Dipslope Farmland Landscape Character Type (LCT) as defined by the Tayside Landscape Character Assessment document. The Dipslope Farmland is a fairly extensive LCT which runs along much of the southern section of Angus, between Birkhill and Auchterhouse in the west all the way to Montrose in the east.

In addition to this landscape there are also a number of other landscape character areas that lie within the study area. **Table 7.4** summarises all the landscape character areas that are situated within the study area. Any areas highlighted in green are not within the ZTV.

**Table 7.4 - Key Characteristics of Landscape Character Types**

Name	Key characteristics
<b>Tayside Landscape Character Assessment</b>	
<b>Coast With Sand</b>	Located between Broughty Ferry and Carnoustie, including Barry Links, where a rounded peninsula of sand dunes extends southwards into the Firth of Tay. Woodland is confined to hedgerows trees and shelterbelts on farmland adjoining the coast. Arable farming tends to occur along the coastal strip with pasture lands on the dune slack and along the lower sections of the river valleys. Fields are bound by hedges and walls with occasional fences.
<b>Coast With Cliffs</b>	Located north of Carnoustie, between Arbroath and the southern end of Lunan Bay. Woodland is absent except on field boundaries and shelterbelts along the coastal strip. Some arable farming takes place on the coastal strip, with medium rectilinear fields where the topography allows. Fields tend to be bound by hedges and walls where they occur.
<b>Broad Valley Lowlands</b>	Located south of the Highland boundary Fault lie five broad lowland valleys or straths. These share a range of common characteristics which set them apart from other valleys and glens. The five areas of Broad Valley lowland are: Strathmore, Strathearn, Strathalan, Lower south and north Esk river valleys and the Pow Water Valley between Gask Ridge and Keillour Forest. Valleys such as Strathmore had comprised extensive areas of rough grazing, scrub woodland and unproductive wetland. Overtime large rectilinear fields were created as the area became predominant in agriculture.
<b>Firth Lowlands</b>	Lying along the northern side of the Firth of Tay, between Perth and Dundee, Bound to the north by the steep Sidlaw Hills, the area forms one of the most fertile parts of Scotland. The area is principally an agricultural area and the landscape is dominated by large, geometric fields. Field boundaries within parcels of land are often absent, the distinction between different fields being marked by drainage ditches or simply changes in crop.
<b>Low Moorland Hills</b>	The Low Moorland hills are formed by a series of east-west ridge like hills with a sharply defined northern edge and gentler eastern slopes. Woodland is limited to the extensive plantation centred on Montreathmont Moor. Agriculture is primarily pasture, much of it occurring on the poorer soils of the upper slopes. Field boundaries where they occur are marked with a variety of hedgerows, stone walls and post-and-wire fences.
<b>Highland Foothills</b>	This is a complex geological structure resulting from its position along the line of the Highland Boundary Fault. It features whale backed hills, winding gorge like main river valleys and is a gateway to the Angus Glens. A complex landscape which features glimpses of the Highlands and lowland areas.
<b>Igneous Hills</b>	The Igneous Hills are a generally open landscape of almost conical summits dominated by grass moorland. Though there are areas of improved pasture and even some cultivation within the more sheltered glens, the land is generally of low fertility. Where they occur field boundaries are marked by a combination of stone dykes and post-and-wire fences, occasionally marked by isolated Scots Pine in upper areas and deciduous species in more sheltered parts. The Ochils have a considerable amount of coniferous forestry, however, the most extensive woodlands are located in the heart of the eastern Ochils. The effect is to transform the sparse, open landscape of the Ochil summits, and to create a sense of enclosure which is absent elsewhere on the hills.

Name	Key characteristics
<b>Mid Highland Glens</b>	These are the mid sections of the principle Highland Glens and contain a concentration of agricultural activity on narrow but distinct valley floors. There is a predominance of rough grazing, bracken, heather moorland with substantial areas of commercial coniferous forestry.
<b>Highland Summits and Plateaux</b>	Are areas of upland separating the principal glens with vegetation patterns that closely reflect the altitude and exposure, including heather, grassland, blanket bog and arctic alpine plant communities. There is little or no settlement and most of the area is managed as open moorland. This area is one of the most remote and wildest landscapes within the UK.
<b>Upper Highland Glens</b>	The upper glens are of comparatively small scale. With little or no floodplain, the valley sides rise steeply so that the glen as a whole is little more than 1 to 1.5km wide at the crest of the enclosing hills. While valley floors are typically between 200 and 250 metres AOD. In the east, these summits are generally rounded. In the west they are craggier and more clearly defined. In both areas it is the mountains and the upland character that extends throughout the glen that shapes perceptions and appreciation of the landscape.
<b>Lowland Basin</b>	The Montrose Basin is a large, rounded estuarine basin formed near the mouth of the River South Esk. The basin is tidal, revealing extensive mudflats at low tide with an area of low lying, drained farmland which extends inland, while the basin is separated from the sea by Montrose, and located on a low peninsula split of land less than 2km wide.
<b>Fife Landscape Character Assessment</b>	
<b>Coastal Hills</b>	Located around the coast of Fife, the Coastal Hills are mainly located above the Coastal Cliffs, Braes and terraces, which slope gradually towards the sea offering panoramic views of the Firths. They are characterised by their strong association with the sights, sounds and smells of the coast and usually comprise large, undulating, regular, open, arable landscapes with few hedges but some linear shelterbelts and policy plantings. These are medium to large-scale, often open or exposed coastal landscapes where the character is always influenced by the sea. Generally a simple, sloping, balanced, active, organised, tended, farming landscape with regular or geometric patterns. These hills mark the transition between coastal and landward areas of Fife sharing characteristics of both.
<b>Coastal Terrace</b>	The Coastal Terraces are mostly flat or gently sloping towards the coast. They are extensively built upon or relatively undeveloped comprising large, open, undulating, arable fields with infrequent or more regular steadings. They have little vegetation cover except policy planting and shelter-belts around the large houses and designed landscapes, or on the steeper slopes often above burns. There are few field boundaries, limited to some hedgerows, stone dykes or post-and-wire fencing primarily around the larger houses and farmsteads. These are coastal landscapes where the character is always influenced by the sea and typically they are a simple, undulating, balanced landscape with muted colours, varied textures and slow movement.
<b>Coastal Flats</b>	The Coastal Flats on the south coast are very flat, low-lying coastal landscapes claimed from the Firth of Forth. On the north-east coast they are developed on blown sands and old dune systems and covered by a variety of land uses such as the afforestation at Tentsmuir Forest, the airfield at Leuchars and the world famous golf courses at St Andrews. Therefore they have a diversity of landscape character but their close association with the sea is ever present in these very flat, low-lying, horizontal, open, large-scale, exposed coastal landscapes. Typically, intensively cultivated, geometrically laid out, large to medium-scale, predominantly arable fields or forestry plantations with rectilinear, fenced enclosures.
<b>Lowland Dens</b>	The Lowland Dens are deeply incised sometimes narrow gorges or valleys cut by fast flowing burns across gently rolling Coastal Hills and Terraces on the north, east and south-east coasts of Fife. Often they have extensive semi-natural woodland with broadleaved trees and few buildings other than occasional steadings or large houses with policies. These are confined, small-scale, intimate, sheltered, textured, colourful, balanced and calm landscapes.
<b>Lowland Open Sloping Farmland</b>	Located in eastern Fife the Lowland Open Sloping Farmland comprises predominantly large, open, sloping, arable fields, often with no field boundaries or with mainly wire fences, low hedges or some stone dykes and little other vegetation cover with relatively few plantations and shelterbelts. This is a large-scale, open or exposed landscape where the character is strongly influenced by the weather conditions and views of the sky. It is a simple, sloping, balanced, active, organised, tended, and farming landscape with regular geometric patterns.
<b>Lowland Hills and Valleys</b>	The Upland Foothills of the Ochils, Lomond and Cleish Hills are very conspicuous, often defining the edge of other landscape types and the extent of views across the lowlands. The natural slopes of the landform of the Foothills are gentler and less pronounced than the Upland Slopes but usually steeper and higher than the Lowland Hills. They too form distinctive backdrops to other landscape types. The Foothills have several conspicuous point features, providing each area with its own identity. They are characterised by a combination of steep sided, rugged, open landform and land cover on the upper foothills, and shallower,

Name	Key characteristics
	smoother, more vegetated or developed landform lower down.
<b>Lowland Glacial Meltwater Valleys</b>	The Lowland Glacial Meltwater valleys are 'U' shaped, flat bottomed channel-like valleys with distinctive often pronounced and frequent eskers, kames and mounds deposited by melting glaciers. Typically used for intensive arable cultivation, the valley floor and lower slopes contrast with the mixed farming or grazing land on the rising slopes. There are medium to large-scale geometric field patterns enclosed by low, gappy hedges or post and wire fences. Steadings are located along distinct lines of transition from fertile valley soils to the poorer soils of hill slopes. They have small, sinuous often inconspicuous burns or small rivers which appear to be too small for the size of the valley. In parts, there are extensive conspicuous sand and gravel quarries disrupting an otherwise generally well organised, tended, balanced, open, locally busy and diverse landscape with regular patterns, smooth textures and seasonally variable colours.
<b>Upland Foothills</b>	The Upland Foothills of the Ochils, Lomond and Cleish Hills are very conspicuous, often defining the edge of other landscape types and the extent of views across the lowlands. The natural slopes of the landform of the Foothills are gentler and less pronounced than the Upland Slopes but usually steeper and higher than the Lowland Hills. They too form distinctive backdrops to other landscape types. There is a lack of settlements but a general abundance of farmsteadings which, along with the many types of woodland are well related to landform, often in association with the frequent burns running down gullies or folds or narrow glens. The Foothills have several conspicuous point features, providing each area with its own identity. They are characterised by a combination of steep sided, rugged, open landform and land cover on the upper foothills, and shallower, smoother, more vegetated or developed landform lower down. These are medium to large-scale, open, simple, sloping, curved, quiet and balanced landscapes with smooth or varied textures and muted colours.
<b>Pronounced Volcanic Hills &amp; Craigs</b>	The Pronounced Volcanic Hills and Craigs form conspicuous, pronounced, often distinctive and recognisable hills or hill ranges sometimes protruding high above the lowlands or extending the uplands or foothills. They form important backdrops to the lowlands. Their distinctive shapes, silhouettes and skylines, with recognisable shapes, peaks and slopes give Fife a strong sense of place and direction. The farmsteadings and woodlands are well related to landform and there is a variety of other individual buildings and structures, sometimes associated with the burns and contributing to the identity of the area. The upper slopes of these Hills and Craigs can be steep sided, rugged and open, contrasting with the shallower, smoother, more open, simple, sloping, curved, quiet and balanced landscapes with smooth or varied textures and muted colours.
<b>South &amp; Central Aberdeenshire Landscape Character Assessment</b>	
<b>Kincardine Links</b>	To the south of Inverbervie, the land is distinctly flat and farm land rises gradually from the Kincardine Links to form a gently sloping apron of land that extends into the more pronounced relief of Garvock and Glenbervie. The wide coastal fringe is the most distinctive element of this landscape character area. Immediately south of Inverbervie it merges with farmland directly or across low steps that mark the edge of the raised beaches. South of St Cyrus they form an enclosed platform, backed by the prominent cliff line, and encompass a considerable tract of farmland as well as areas of saltmarsh and dune close to the North Esk Estuary.
<b>Garvock &amp; Glenbervie</b>	The Garvock & Glenbervie landscape character area include an extensive area of rolling farmland which encompasses not only Garvock Hill in the south-west of the area, but the farmland around Glenbervie at the edge of Highland Boundary Fault. The character of the area stems essentially from its relief, a series of sweeping, rolling hills that present distant views and draw the eye up and down the terrain. The area has a bold geometric field pattern. The few coniferous plantations are generally small and although they may be prominent on top of hills, their influence on landscape character is slight.
<b>The Mounth</b>	The Mounth character area forms a large expanse of Moorland Plateaux, where the foothills of the Grampians extend almost to the coast at Stonehaven. Its location emphasises the relief of this unbroken ridge which looms over the flat farmland of Howe of the Mearns to the south. Its eastern foothills, which tumble down to the coast, are less dramatic and form a more gradual transition with surrounding farmland. Lower slopes are forested but the plateau itself is covered by a pelt of heather moorland which extends westwards into the Cairngorms revealing a strong, rolling relief whose ridges recede into the distance across interlocking horizons. The plateau is an exposed and wild landscape, but rarely inhospitable enough to escape human influence.
<b>Howe of the Mearns</b>	The Howe of the Mearns encompasses some of Scotland's most fertile soils. Its relief is emphasised by the steep moorland slopes which rise abruptly behind it marking the line of the Highland Boundary Fault. It is a colourful landscape; vivid fields of red soil are juxtaposed with the bright greens of pasture or young cereals, while at other times fields of rape, daffodils and tulips present a startling patchwork of colours. As with other lowland farmlands, the distinctive character of this landscape derives from its large pattern of fields, crops and woods and, while this is obscured from low level views in its midst, it can be seen from elevated locations such as the moorland ridge to the north or the Garvock Hills to the south.

## Broad Townscape Context

The turbine would be located within the Arbroath settlement boundary and as such a townscape assessment has been undertaken. On the east of the settlement is the old fishing harbour which has been modernised over time with the construction of a wet dock. Set back from the harbour is the historic centre of Arbroath, which is focussed on the Abbey, with narrower streets and fairly high density residential and retail areas.

Over time the settlement has expanded and peripheral housing estates both local authority and privately developed have helped to expand the town boundaries. While some of the historic centre has been designated as a heritage zone others have made way for more modern developments such as supermarkets and new buildings.

**Table 7.5** below indicates and briefly describes each of the different areas of townscape character that can be found within Arbroath.

**Table 7.5 – Key Characteristics of Townscape Character Areas**

Name	Key characteristics
<b>Arbroath</b>	
<b>Harbour and Waterfront</b>	This area forms a prominent character area along the waterfront to the east of the settlement and provides a focus of employment and activity. As well as the industrial landscape there are recreational areas for the local community including play parks, leisure centre and paths spread along the waterfront. The local football stadium Gayfield Park is also located in this coastal area. Buildings, predominantly residential properties tend to be two storey terraces, set back from the harbour and the waterfront. The A92 runs through the settlement with fairly open views over the less developed areas of the coast to the west of the settlement.
<b>Historic Centre</b>	This area is the core of the original settlement and is of a more dense nature containing much narrower streets than the rest of the settlement, which forms a tight linear town centre dictated by the topography. Building styles are mostly older in nature, being two or three storeys in height, stone and Victorian in style. Land use is a mix between residential and small scale retail, with a number of shops clustered along the streets particularly South Street and North Street. Most of this character area is designated as a Conservation Area, part of the Angus Heritage Institute.
<b>Buildings in Space</b>	These areas include community facilities such as schools, libraries and hospitals which sit in public space or have large grounds and are not part of the overall settlement pattern. This type of townscape is traditionally found located in the centre of residential estates or along main transport routes and offers a focal point and natural centre to neighbourhoods and provides some open space.
<b>Open Spaces</b>	Open spaces are primarily located within or adjacent to residential areas to provide amenity green space for the residents and includes parks, gardens, semi-natural green space, green corridors, beaches and cemeteries. These areas tend to be landscaped or have some form of planting regime. Areas include the cemetery, High Common, Boulzie Hill and the Keptie Pond.
<b>Local Authority Housing</b>	This townscape character can be seen across many settlements in Scotland and forms large areas of many towns, primarily in a rectilinear pattern albeit with some occasional crescents. Building styles are dominated by 2 storey semi-detached housing that dates from about the 1960s.
<b>Flats / High Density Housing</b>	There are a number of areas within Arbroath of higher density flats, many of these are incorporated into the local authority housing areas. The buildings styles are fairly uniform all with similar finishing and pale grey in colour arranged in rows with amenity areas around them.
<b>Modern Residential Estates</b>	These areas are a result of recent settlement expansion and feature a combination of single storey bungalows and two storey detached and semi-detached housing. They form a pattern of cul-de-sacs and crescents bordered by areas of amenity grassland and tend to be of a lower density than residential areas nearer the centre. These areas tend to be found the outskirts of Arbroath and have an inward orientation arranged in estates. Hospitalfield is an example of this townscape type.



Name	Key characteristics
Industrial Estates	Industrial estates form a distinct area of townscape character with a mix of light industry, warehouses and some retail, usually containing large tarmaced areas and some planting regimes. There is a variety of building styles, ranging from small offices to larger warehouses; however they tend to all be single storey except for the Maltings Plant which is up to three storeys in some parts. This type of character can usually be found on the settlement edge to the west and north-west.

### Land use and Landscape Change

The Bairds Malt turbine is located within the Elliot industrial estate on the western edge of the settlement of Arbroath. The landscape to the west gives way from the urban landform to become surrounded by farmland, which is predominantly mixed arable with fields varying between arable and grazing. The site itself is located within the Maltings plant which is located within the industrial estate. The landscape to the east and north is dominated by the urban areas of Arbroath, with housing estates, the historic town centre and the harbour on the nearby coast. The settlement of Arbroath has expanded over time, claiming parts of the arable farmland which covers much of the wider area, and moving northwards away from the coast. The main transport links in the area are the A92 Dundee to Stonehaven road which passes just over 550m to the south-east of the site, and the A933 Arbroath to Brechin Road which is 570m to the east. There are a number of vertical features in the local area associated with the local settlement of Arbroath including communication masts and church spires.

### Local Townscape Character

The townscape immediately around the site is characterised by the industrial nature of the surrounding landscape, with the turbine location proposed within the industrial estate's land holding, located on the western edge of Arbroath. The turbine location is currently adjacent to a number of fairly large scale industrial units and small warehouses which comprise the Maltings workings and the wider industrial estate. The landcover is predominantly concrete, with no vegetation on site save a band of mature shelterbelt which provides some screening for the residents within the neighbouring housing estate. The existing buildings are a variety of style and finishes, primarily concrete or metal clad adding to the industrial feel of the area; outwith the Maltings towers these do not exceed three storeys in height.

### *Townscape Elements and Features*

Townscape elements are the component parts of the townscape such as building typologies, streets and open areas including parks and waterfronts. Often these characteristic elements may be distinctive to particular regional areas or more localised areas of townscape character which help form a distinct character. The main elements of townscape character which typify the settlement include the historic town centre, defined by the ruinous Abbey, and narrow street pattern, which connect down to the harbour and the waterfront. Peripheral housing estates have increased the size of the settlement over time; these tend to be located around the edge of the settlement.



### **Dipslope Farmland Landscape Character Type**

Adjacent to the settlement of Arbroath and the Elliot Industrial estate is the Dipslope Farmland LCT, this landscape character type surrounds Arbroath and is defined by SNH in the Tayside Landscape Character Assessment and is described below:

*"The area falls from up to 180 metres in the north-west to about 50 metres along the coastal strip. The Dipslope blends almost imperceptibly into the southern slopes of the Sidlaws and Montreathmont Hills.*

*This is one of the most fertile and productive agricultural areas in Scotland, with much of the land being categorised as Classes 1 or 2. It is not surprising, therefore, that intensive agriculture, based on cereals, is the dominant land use. Fields tend to be large and rectilinear. Woodland cover is low or even absent in some areas, particularly closest to the coast, creating an open, exposed landscape in places. Elsewhere, particularly on some of the larger estates more extensive woodland survives, comprising a mixture of shelterbelts and hedgerow trees. Where these survive, the landscape is enclosed and structured. Often the trees are wind trimmed and bent slightly away from the coast. Semi natural woodland is limited to steeper valley sides. A dense scatter of more isolated farmsteads is supplemented by a number of isolated houses, reflecting the proximity to Dundee and Arbroath. Both settlements are, however, relatively well hidden in this otherwise open landscape. Dundee is screened by a ridgeline running parallel to the Firth of Tay, while Arbroath occupies lowland at the mouth of a shallow valley."*

### **Broad Visual Context**

To the east of the site the coastline and North Sea provide significant features, present in many views throughout the area, settlement is located up and down the coastline with Arbroath, Montrose and Carnoustie local examples. Inland the landscape is dominated by agricultural land, the topography consisting of gently sloping land, occasionally interrupted by tree plantations of various kinds or small clusters of trees surrounding the farm steadings and dispersed settlement which dots the countryside. Electricity pylons and communications masts frequently cross the landscape. Long distance views are limited, occurring more prominently over the coastline with the vast expanse of the sea stretching out to the east. Views inland area interrupted by the gentle rise in the topography and vegetation features. Within Arbroath itself views tend to be more internal, looking along narrow streets of the central areas or the more enclosed housing estates around the periphery of the settlement. All the time, however, the viewer is reminded of the coastal location with the shore and sea catching the eye through gaps in the townscape or providing a backdrop to many vistas. Views from the more elevated locations within the settlement offer some longer distance views above the rooftops and church spires to the south and west.

### **Weather conditions**

Changing weather patterns and local climatic conditions will influence the visibility of the development in terms of the extent of view, the colour and contrast of the turbine and thus the perceived visual impact. There will be periods of low visibility (fog, low cloud, and bright sunny conditions that are accompanied by haze generated by temperature inversions) as well as periods of high visibility in clear weather. In some instances and from some

locations it may be ‘back-lit’ (e.g. appearing darker in colour during sunset/sunrise and periods of pale or white blanket cloud) and in other circumstances may appear to be ‘up-lit’ (e.g. during stormy periods that combine dark clouds and bright sunshine).

### Landscape Planning Designations

The study area for the proposed development as shown in **Figure 7.1** is located primarily within the Angus Council area, with areas of Fife and Aberdeenshire also included. The local development plans contain a number of policies which seek to protect landscape resources. The site itself is not located within any designated landscape; however, there are other landscapes within the study area which are designated. The key landscape planning designations are illustrated in **Figure 7.3**.

Landscape planning designations and policies are considered in the determination of the sensitivity of landscape receptors as they provide an indication of value ascribed to the landscape resource.

Those designated landscapes that overlap the ZTV (and may potentially have views of the proposed development) have been considered as part of this assessment and are listed in **Table 7.6**. Other planning policies and designated landscapes located out with the ZTV have been excluded from further study as they will not experience any effects from the proposed development.

**Table 7.6 - Landscape Planning Designations**

Designation	Description
Fife Council - Special Landscape Areas (SLA)	<b>Tay Coast.</b> The SLA is made up of a long band of low hills and coastal landscapes that border the southern shores of the Firth of Tay and extend from Newport on Tay to Newburgh. The western boundary is formed by the slopes containing the basin of Lindores Loch, while the south-western boundary follows the foot of Dunbog Hill. The A92 forms the southern boundary before heading towards the coast at the foot of hills to Wormit. In the east of the area, the southern boundary again follows lower hill slopes around St Fort and minor roads on the boundary of the Scotsraig Estate. The designation is located ~19.4km to the south-west of the proposed development and is covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.
	<b>Tentsmuir Coast.</b> The SLA comprises the coastal dunes and long sandy beach of Tentsmuir Sands extending from the River Eden estuary to Tayport. The western boundary of this area is drawn just inside the edge of the extensive Tentsmuir Forest. It is situated 16.5km from the development to the south-west and is covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.
	<b>Tarvit and Ceres.</b> The SLA comprises the valley of the Ceres and Craigrothie Burns and the softly rolling hills which contain it. Extending from the A914 at Cupar to the B940 at Pitscottie in the west, to Falfield, New Gilston and east to the A916. The designation is situated 30.2km to the south-west of the turbine and covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.
	<b>St Andrews Links.</b> The SLA is located on the western coast of Fife to the north of the settlement of St Andrews, covering the world famous St Andrews Golf Courses and West Sands. The designation is situated 23.8km to the south-west of the proposed development and is covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.
	<b>Craigtoun.</b> The SLA includes the Kinness, Claremont, Lumbo and Cairns Dens which extend from the south-west of St Andrews broadly from the B939 to the A919 and incorporating the wooded valleys which lie within this area and Craigtoun Country Park. It is situated 28.4km distance from the development to the south-west and covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.
	<b>St Andrews and Fife Ness.</b> The SLA incorporates the coastal edge which extends from the urban edge of St Andrews at the junction of the A917 and the B9131 incorporating Boarhills, Kingbarns and the

Designation	Description																										
	policies of Cambo and extending around the coastal edge of Fife Ness to Crail. The designation is located 26.1km to the south and covered by <b>Policy E19</b> in the St. Andrews and East Fife Local Plan.																										
Aberdeenshire Council - Area of Landscape Significance (ALS)	<b>Johnshaven Coast ALS</b> is a small area around the settlements of Johnshaven and St Cyrus. This designation covers a narrow strip of landscape along the coast and is located ~25.5km to the north-east of the proposed site. This designation is covered by <b>Policy Env\5A</b> in the Aberdeenshire Local Plan.																										
	<b>Marr ALS</b> is a large area of landscape covering both the Dee Valley and the uplands south of this. It covers much of the north-western half of the study area and is located ~31.7km to the north of the proposed site. This designation is covered by <b>Policy Env\5A</b> in the Aberdeenshire Local Plan.																										
Gardens and Designed Landscapes (GDL)	(Listed in the Inventory of GDL for Scotland) are designated for their unique combinations of horticultural, landscape, scenic and historic interest. There are 26 Gardens and Designed Landscapes within the study area, which are located within the various council areas. The GDL's are covered by <b>Policy ER20</b> in the Angus Local Plan, <b>Policy E15</b> in the St Andrews and East Fife Local Plan, <b>Policy Env\20</b> in the Aberdeenshire local Plan and <b>Policy 16</b> in the Dundee Local Plan. A list of all GDL's within the study area is provided below:																										
	<table border="1"> <tbody> <tr> <td>The Guynd</td> <td>Cortachy Castle</td> <td>The Burn</td> </tr> <tr> <td>Baxter Park</td> <td>House of Pitmuies</td> <td>Fasque House</td> </tr> <tr> <td>Balgay Park</td> <td>Guthrie Castle</td> <td>Naughton</td> </tr> <tr> <td>Camperdown House</td> <td>Brechin Castle</td> <td>Earlshall</td> </tr> <tr> <td>Rossie Priory</td> <td>Edzell Castle</td> <td>Dalgairn</td> </tr> <tr> <td>Drumkilbo</td> <td>Kinnaird Castle</td> <td>St Andrews Links</td> </tr> <tr> <td>Glamis Castle</td> <td>House of Dun</td> <td>Craigtoun</td> </tr> <tr> <td>Airlie Castle</td> <td>Dunninald</td> <td>Cambo</td> </tr> <tr> <td>Ascreavie</td> <td>Craig house</td> <td></td> </tr> </tbody> </table>	The Guynd	Cortachy Castle	The Burn	Baxter Park	House of Pitmuies	Fasque House	Balgay Park	Guthrie Castle	Naughton	Camperdown House	Brechin Castle	Earlshall	Rossie Priory	Edzell Castle	Dalgairn	Drumkilbo	Kinnaird Castle	St Andrews Links	Glamis Castle	House of Dun	Craigtoun	Airlie Castle	Dunninald	Cambo	Ascreavie	Craig house
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Glamis Castle	House of Dun	Craigtoun																									
Airlie Castle	Dunninald	Cambo																									
Ascreavie	Craig house																										

### Visual Baseline and Receptors

Visual receptors would include anyone who may have visibility of the turbines, such as people who may work in the area, residents or tourists. The table below identifies all visual receptors that were considered as part of the assessment.

**Table 7.7 - Landscape Planning Designations**

Visual Receptor	Description
Residents	There are a number of properties located within 2km of the development these include Crudie, Peasiehill Farm and Cottages. As well as the neighbouring housing estate.
Settlements	Settlements that will be assessed include Arbroath, Arbirlot and Carnoustie. Photomontages have been produced for a number of these settlements. Settlements out with 15km are unlikely to experience significant visual effects.
Road Users	The A92 has been assessed both with regards to the impact of Bairds Malt Wind Turbine and any potential sequential cumulative effects.
Recreational	Recreational receptors in the area mostly refer to core paths and the National Cycle Network which crosses the wider area.

### 7.6 Assessment of Landscape Effects

Landscape Effects are defined by the Landscape Institute as “*Change in the elements, characteristics, character, and qualities of the landscape as a result of development.*” These

effects are assessed by considering the landscape sensitivity against the magnitude of change. The matrix used to guide the evaluation or level of effect as illustrated in **Table 7.2**. The type of effect may also be described as temporary or long term/permanent, direct or indirect, cumulative and positive, neutral, or negative.

### **Indirect Effects on the Dipslope Farmland LCA**

#### *Landscape Sensitivity of the Dipslope Farmland LCA*

The Dipslope Farmland area covers a large section of the study area surrounding the site and running east to west where it stretches all the way to Montrose. The low lying character area is dominated by arable farming practice, and with little in the way of woodland, the land cover is predominantly large rectilinear fields as it stretches between the Sidlaw Hills and the Forfar Hills. The condition/quality of the landscape is generally medium.

In terms of landscape value, within the study area, the landscape area is not designated. As an area that is defined by large scale agriculture with constantly changing crop coverings and other significant infrastructure such as the A90 and communication masts common features, the landscape value is considered to be medium.

The overall sensitivity of the Dipslope Farmland is considered to be medium.

#### *Magnitude of Change*

During operation, the Bairds Malt Wind Turbine would occupy and directly affect a negligible area of the Dipslope Farmland area, however it may be visible from across the character area indirectly affecting its character (and similarly affecting a small proportion indirectly). The ZTV indicates that other than the landscape immediately around the site inside ~4km, much of this landscape is actually free from visibility. When visible the turbine will appear alongside the Maltings industrial workings. Even when visible from these more remote areas the turbine will be visible in a section of the landscape which is less scenic, lower in altitude and already characterised by structures such as masts and electricity pylons and the settlement of Arbroath. The magnitude of change on the Dipslope Farmland resource would be negligible, resulting in a **minor** level of effect, which would be long term (reversible), direct/indirect and negative.

### **Indirect Effects on Neighbouring Landscape Character Areas**

Neighbouring areas of landscape character are formed by coastal landscapes, lowlands and uplands.

None of these areas would be directly affected by the wind turbine and there would be no direct effects on the key physical characteristics that form the areas' landscape character or their quality and integrity. However, the turbine may be visible from these areas and as such could indirectly affect the landscape character where particular views or scenic qualities are noted as a key characteristic of the landscape. Alternatively, the wind turbine could be frequently visible and particularly prominent in the landscape such that the addition of this new feature affects the character of the area. In this instance the development is not located on a prominent summit, and views will be restricted to the immediate landscape and to the east and west of the development.

Table 7.8 - Indirect Landscape Effects on Neighbouring Landscape Character Areas

Landscape Character Area	Assessment
<b>Tayside Landscape Character Assessment</b>	
<b>Coast With Sand</b>	<p>The Coast with Sand character area is one of the closest neighbouring areas to the proposed development located ~680m to the south at its closest point. The character type occurs in several areas to the north and south of the proposed development. The ZTV indicates theoretical visibility over the areas to the south and south-west of the development. From the close in area near Elliott on the edges of Arbroath the view is considered to be similar to those shown in <b>Viewpoint 2</b>. The turbine appearing in the view as a prominent feature alongside the infrastructure of the maltings and some surrounding woodland. From the surrounding areas around Barry Links and Lunan Bay to the north the views are less prominent, with the intervening landscape beginning to screen the development, combined with built features and vegetation the visibility of the development quickly becomes reduced.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be low and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>Coast With Cliffs</b>	<p>The Coast with Cliffs character area sits between the Coast with Sand character areas, occurring in three distinct locations within the study area. The closest area is located ~2.4km to the south-west of the proposed development. From this area around New Haven there may be some potential views of the turbine. The intervening bands of shelterbelt which populate the wider landscape would screen potential views, with the any views limited to the upper sections of the turbine which would be viewed against the sky.</p> <p>These views would be limited with the other areas to the north of Arbroath gaining limited views.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be low and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>Broad Valley Lowlands</b>	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
<b>Firth Lowlands</b>	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
<b>Low Moorland Hills</b>	<p>The Low Moorland Hills character area is located ~11.7km to the north-west of the proposed development. The ZTV indicates an area of theoretical visibility around the Montreathmont Moor and Forest in the north-east of the character area. Views from within this area are extremely limited with on the blades and blade tips visible. At this distance the intervening landscape features including woodland and other built features would likely screen any of these potential views.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>minor</b>, indirect, negative and reversible.</p>
<b>Highland Foothills</b>	<p>The Highland Foothills Character are occurs in several zones to the far north-west of the study area situated ~25.2km from the proposed turbine. The character area is predicted to be largely free of any potential views according to the ZTV save for a small area around the Caterthun Forts and Kirkton of Menmuir. At this distance the single turbine would be a barely distinguishable feature in the view. The intervening landscapes providing screening for the turbine.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>Igneous Hills</b>	<p>The Igneous Hills character area is situated ~12.3km to the west of the proposed development. The ZTV indicates minimal areas of theoretical visibility around the summits of Carrot and Gallow Hill. From these elevated locations the turbine would be a barely discernible feature in the wider landscape with long distance views overlooking the eastern coast and southwards towards the Tay estuary and Fife.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>Mid Highland Glens</b>	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
<b>Highland Summits and Plateaux</b>	<p>The Highland Summits and Plateaux character type occurs in several locations around the north-western edges of the study area due to their elevated nature at their closest point the character area is located ~30km from the turbine. Views of the turbine would be extremely limited, with the intervening topography screening the majority of views. Where visibility does occur it is limited in most cases to the blade tips of the turbine, at this distance the development is not predicted to be an easily discernible feature in any views.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would</p>

Landscape Character Area	Assessment
	be negligible and the overall level of effect would be <b>moderate/minor</b> , indirect, negative and reversible.
Upper Highland Glens	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
Lowland Basin	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
<b>Fife Landscape Character Assessment</b>	
Coastal Hills	<p>The Coastal Hills landscape character area occurs in several areas throughout Fife on the northern and eastern coasts. The closest area is situated ~19.6km to the south-west of the proposed turbine around Tayport on the northern coast of Fife. Views from these areas on the north coast would be extremely limited with only the blade tips theoretically visible. On the eastern coast around St Andrews, the turbine is theoretically visible against the surrounding landscape, in reality these views will occur over a distance of ~26.7km. At this distance it is unlikely that the turbine, viewed against the distant coastline will be an easily discernible feature in this view.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
Coastal Terrace	<p>The Coastal Terrace landscape occurs in several locations on the eastern coast of Fife, generally set back from the immediate coast, except for the area around Cambo and Fife Ness. This character area is situated ~25.9km to the south of the proposed development. With the primary views from this area facing east towards the sea and south towards the Firth of Forth, it is unlikely that the proposed development will be an easily discernible feature in any views.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
Coastal Flats	<p>The Coastal Flats character type occurs predominantly on the north-eastern coast of Fife around Tentsmuir. The ZTV indicates theoretical visibility across much of the area, however, due to the wooded nature of the surrounding views would be extremely limited. Any views from this location are unlikely to be significant given the distances from the turbine, 16.5km.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
Lowland Dens	<p>The Lowland Dens character area occurs in several areas across Fife. The ZTV indicates theoretical visibility from many of the more elevated parts of these character areas. Due to their location significant views from within these areas are unlikely. The closest area is situated ~25.7km from the proposed development. The intervening built features and vegetation would likely combine to completely screen any views.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
Lowland Open Sloping Farmland	<p>The Lowland Open Sloping Farmland character area sits to the far south of the study area, located ~27.3km from the proposed development. The ZTV indicates theoretical visibility over the northern parts of the character area. In reality at this distance views of the turbine are not likely to be possible. Intervening features including the built environment and vegetation would combine to screen any potential views.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>minor</b>, indirect, negative and reversible.</p>
Lowland Hills and Valleys	<p>The Lowland Hills and Valleys character type occurs in several locations within Fife. The ZTV indicates some theoretical visibility from the more elevated locations within these areas. Although in reality views are unlikely to occur. A combination of distance and other features in the wider landscape such as woodland and built features combining to restrict any views.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>minor</b>, indirect, negative and reversible.</p>
Lowland Glacial Meltwater Valleys	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
Upland Foothills	The Upland Foothills landscape occurs in three distinct areas within the study area, around the north of Fife. The ZTV indicates some theoretical visibility over the eastern fringes of the character areas. Located over 19km from the proposed development it is unlikely that there will be any significant views possible towards the development.



Landscape Character Area	Assessment
	The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b> , indirect, negative and reversible.
<b>Pronounced Volcanic Hills &amp; Craigs</b>	<p>The Pronounced Volcanic Hills &amp; Craigs character areas occur in several locations throughout Fife, located over 30km from the proposed development. The ZTV indicates some minimal patches of visibility within these areas, however, at this distance it is unlikely that any significant views of the proposed development will occur, the features in the wider landscape including settlements, vegetation and other built features combine to screen views.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>South &amp; Central Aberdeenshire Landscape Character Assessment</b>	
<b>Kincardine Links</b>	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.
<b>Garvock &amp; Glenbervie</b>	<p>The Garvock &amp; Glenbervie character area is located 24.1km to the north of the proposed turbine. The ZTV indicates a small area of theoretical visibility over the most elevated areas near Dykelands. From this location views of the turbine are limited to the very tips of the blades and would appear solely against the open coastal views to the east. It is not predicted there will be any significant views possible of the development from this area.</p> <p>The landscape character area is considered to be of medium sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>minor</b>, indirect, negative and reversible.</p>
<b>The Mounth</b>	<p>Located on the northern edge of the study area the Mounth character area is situated almost 35km from the proposed development. The ZTV indicates an area of theoretical visibility from within the area, however, in reality the views are restricted by topography to the blade tips of the turbine, which at the distance would not be visible.</p> <p>The landscape character area is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>, indirect, negative and reversible.</p>
<b>Howe of the Mearns</b>	There are no views of the development from within this landscape character area. Therefore there would be no indirect effects on its character.

### Direct and Indirect Effects on Landscape Planning Designations

The site area is not designated and there would be no direct effects on any designated landscape areas. Any landscape effects therefore would be limited to indirect effects on the views and visual character experienced from within these areas, whilst viewing towards the wind turbine. The assessment below considers if these effects on the views would lead to an indirect effect on the landscape character and valued features and characteristics for which these areas are designated.

The assessment of the overall indirect effects experienced by people viewing the wind farm from within these areas is provided in **Table 7.10**. The sensitivity of all designated landscapes considered as part of this assessment has been considered as high.

**Table 7.9 - Indirect Landscape Effects on Landscape Planning Designations**

Designation	Assessment
<b>Fife Council - Special Landscape Areas (SLA)</b>	
Tay Coast SLA	At its closest point this designation would be ~19.4km to the south-west of the proposed development covering the coastal areas and upland foothills of northern Fife. The ZTV indicates there will be very little visibility from within this relatively large designation, with potential views restricted to an area of the north-east coast around Tayport and some intermittent views from the most elevated areas within the designation. At this distance, the views of the proposed development are extremely limited, with



Designation	Assessment
	<p>only the upper sections of the turbine theoretically visible. It is unlikely that there will be any significant views of the proposed turbine from within this SLA.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Tentsmuir Coast SLA	<p>The Tentsmuir Coast is situated on the north-east coast of Fife ~16.5km to the south-west of the proposed development. From this coastal area there are theoretical views of the proposed development to the north-east. The turbine appears predominantly against the landscape from this location and over this distance views are likely to be significantly screened by the built features of intervening coastal settlement such as Carnoustie and other features such as woodland and farming infrastructure in the wider landscape.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Tarvit and Ceres SLA	<p>The Tarvit &amp; Ceres designation is located over 30km to the south-west of the turbine covering the Hill of Tarvit and the settlement of Ceres. The ZTV indicates a minimal area of theoretical visibility around the most elevated areas within the designation. At this distance it is unlikely that there will be any significant views of the proposed development.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
St Andrews Links SLA	<p>This designation is located ~23.8km to the south-west of the proposed development. The ZTV indicates theoretical visibility over the designation. The turbine appears theoretically to the north-east, where views do occur the turbine would be viewed against the surrounding landscape and at this distance it is unlikely that it will be a discernible feature in any views from within this designation.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Craigtoun SLA	<p>Located inland from St Andrews, Craigtoun is situated ~28.4km from the proposed turbine. The ZTV indicates theoretical visibility over the whole designation, however, in reality views are unlikely to occur over this distance, with the turbine located near the distant coastline to the north-east of the designation. Features present within the landscape including vegetation, woodland and other built features combining to screen any potential views of the development from within this landscape.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
St Andrews and Fife Ness SLA	<p>The St Andrews and Fife Ness SLA is located ~26.1km to the south of the proposed development. The ZTV indicates theoretical visibility over much of the designation. At this distance the turbine would be a barely discernible feature, amongst the developed coast to the north, with other features including woodland also present in any views.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
<b>Aberdeenshire Council - Area of Landscape Significance (ALS)</b>	
Johnshaven Coast ALS	<p>There is no visibility of the development predicted from this designation and as such there will be no impact on its unique character as an ALS.</p>
Marr ALS	<p>The Marr ALS is located on the northern boundary of the study area ~32km from the proposed development. The ZTV indicates some theoretical visibility from within this area; however, at this distance it is unlikely that the turbine will be an easily discernible feature within the open landscapes to the south.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
<b>Gardens and Designed Landscapes (GDL)</b>	
The Guynd	<p>The Guynd GDL is located ~4.2km to the west of the proposed development; the property is set within an area of dense mature woodland. The ZTV indicates theoretical visibility over much of the GDL; however, there are no views towards the coast from within the GDL, due to the bands of dense mature woodland which bound the area on all sides, screening all potential views of the turbine from within the designation.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>

Designation	Assessment
Dunninald	<p>Dunninald is located ~15.9km to the north of the proposed development. The ZTV indicates a small area of theoretical visibility over the southern edges of the GDL. The property and gardens are set within an area of mature woodland which encloses the area. The mature woodland provides screening from the GDL and would limit any outward views towards the proposed turbine.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Earlshall	<p>Earlshall is located ~24.1km to the south-west of the proposed development. The property and gardens are located near to RAF Leuchars, set within an area of woodland there are no outwards views towards the proposed development from this location.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
St Andrews Links	<p>Similar to the designation that also covers the area, there may be some potential visibility of the proposed development from this location, however, the turbine is located ~24km from the designation which overlooks the St Andrews Coastline and offers long distance views over the North Sea. Views up the coast would be limited by coastal development and vegetation.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Craigtoun	<p>The GDL is heavily screened by woodland, which would limit any potential views of the development. Similar to the wider designation, views are unlikely to occur and over this distance any views would not be significant.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>
Cambo	<p>Located ~27.6km from the proposed development, the ZTV indicates theoretical visibility over much of the GDL. The designation is set within an area of mature woodland which encloses the gardens and the surrounding properties from outwards views. With any views focused to the east over the nearby coastline, it is unlikely that there will be any views of the development from within the GDL and surrounding areas.</p> <p>The landscape designation is considered to be of high sensitivity. Overall the magnitude of change would be negligible and the overall level of effect would be <b>moderate/minor</b>.</p>

### *Sensitivity of Local Townscape Character*

The site is currently used for industrial purposes and has no notable natural landscape features or elements. Prominent features include the operating Maltings buildings, predominantly made of corrugated metal, fencing and tarmaced surfaces with some boundary planting between the neighbouring housing estate at Hospitalfield, which consists of mature and semi mature woodland. There are no designations on this section of townscape and it has little value with regards to the townscape of the settlement, as the site is impermeable and lacks any legibility. The sensitivity of this townscape to a development of this type would be low.

### *Magnitude of Change*

The turbine would directly affect a moderate proportion of this townscape. There would be no elements of townscape lost and the industrial nature of the development would work well within the existing townscape. The addition of this turbine may actually give some legibility to the site, viewed alongside other industrial elements within the local area. The finish of the turbine will blend with the surrounding industrial finished on the local buildings which tend to be matt grey concrete or metal cladding. Any effects should be considered neutral, culminating in a **moderate/minor** overall magnitude of change. The overall level of direct landscape effects on the local landscape character resource would be minor, long term (reversible) and neutral.

### Indirect Effects on Adjacent Townscape Character

The surrounding area consists primarily of residential areas, with the historic centre to the north and harbour and waterfront areas to the east.

The residential area of Hospitalfield to the north would be indirectly affected by the addition of the proposed turbine. The potential visual effects from this area are discussed in detail within the residential assessment, with photomontages showing a number of views from within the area. Across the wider settlement views would be severely limited, with only the more open and elevated areas of landscape such as Boulzie Hill experiencing any potential views of the proposed turbine. Where visible the turbine would appear alongside the industrial features associated with the Maltings workings. None of these areas would be directly affected by the turbine and there would be no direct effects on the key physical characteristics that form the areas townscape character or their quality and integrity. The indirect effects are assessed in **Table 7.8**.

**Table 7.10 – Indirect Townscape Effects**

Townscape Character	Assessment
<b>Arbroath</b>	
<b>Harbour and Waterfront</b>	<p>This area covers the coastline running from the east of the proposed turbine. The views from the harbour would be limited by the built environment which lines the streets behind the harbour. The views from the more open coastal areas on the edge of the settlement are considered in <b>Viewpoint 1</b>. The turbine would be viewed to the south when approaching the harbour, although it would not appear in the same general views from the immediate coastal areas.</p> <p>The townscape character is considered to be of medium sensitivity. Overall the magnitude of change would be <b>high</b> and the overall level of effect would be major/moderate, indirect, neutral and reversible.</p>
<b>Historic Centre</b>	<p>This area sits ~2km to the east of the proposed turbine and theoretically will have views of the turbine throughout the character area. The buildings in this area are a mix of two and three storeys and streets tend to be fairly narrow which would restrict potential views of the proposed turbine. When visible from more open areas around Boulzie Hill, as shown in <b>Viewpoint 4</b> the turbine will be viewed as part of the industrial area along the edge and not associated with the historic centre, where views tend to be focused internally or across the nearby harbour to the coast.</p> <p>This character is considered to be of high sensitivity as much of it falls within the Conservation Area. Overall the magnitude of change would be <b>low</b> and the overall level of effect would be moderate, indirect, negative and reversible.</p>
<b>Buildings in Space</b>	<p>These areas tend to be located within the housing areas to the east and around the historic centre of the town. Views of the turbine are unlikely and would tend to be screened by intervening buildings and vegetation. When travelling through the settlement it would be unlikely that there would be views of these areas and the turbine together.</p> <p>This character is considered to be of low sensitivity, as receptors tend to comprise public buildings and service centres. Overall the magnitude of change would be <b>low</b> and the overall level of effect would be minor, indirect, negative and reversible.</p>
<b>Open Spaces</b>	<p>The most prominent areas of open space are Boulzie Hill and the area surrounding Keptie Pond, as well as other areas around the coastline and throughout the settlement. The ZTV indicates theoretical visibility from much of these areas. The views from the elevated area around Boulzie Hill are considered in <b>Viewpoint 4</b>. The lower lying areas around Keptie would be heavily screened by the intervening woodland that bounds these areas and views would be unlikely.</p> <p>This character is considered to be of high sensitivity, providing a green and open space within the settlement. Overall the magnitude of change would be <b>low</b> and the overall level of effect would be moderate, indirect, negative and reversible.</p>
<b>Local Authority Housing</b>	<p>The local authority housing areas occur to the north of the historic centre, with a crescent pattern of predominantly two storey semi-detached properties in an area called Deepdale. The generally rectilinear pattern of the estate means external views are limited. There are two other areas to the north-east of the</p>

Townscape Character	Assessment
Flats / High Density Housing	<p>historic centre the Hayshead and Clifftown areas of the town, follow a similar street and development pattern to Deepdale. Potential views from within these areas are limited, a combination of intervening built features and woodland which bounds local open spaces and parks limit views outwith the immediate area.</p> <p>This character is considered to be of high sensitivity, as the main residential areas for local residents within the settlement. Overall the magnitude of change would be <b>low</b> and the overall level of effect would be moderate, indirect, negative and reversible.</p>
Modern Residential Estates	<p>These areas are limited with some new local authority development replacing older dwellings around the historic centre and around Hospitalfield where there are a small number of flatted developments over three storeys. As well as these areas there are some higher density blocks around the local authority housing areas.</p> <p>This character is considered to be of high sensitivity, as high density living areas. There are no significant impacts predicted from these areas, these developments tend to be located near main roads such as Arbirlot Road. The overall magnitude of change would be <b>low</b> and the overall level of effect would be moderate, indirect, negative and reversible.</p> <p>These areas are located on the very edges of the settlement or have been developed on Brownfield sites within the settlement. Hospitalfield and Warddykes are examples of more modern estates within Arbroath. The Hospitalfield area has been considered in greater detail as part of the settlement assessment as one of the neighbouring areas to the proposed development.</p> <p>The character of these areas is considered to be high, as residential areas. Overall the magnitude of change would be medium and the overall level of effect would be <b>major/moderate</b> for those neighbouring areas while other areas are considered to be moderate.</p>
Industrial Estates	<p>These tend to be located around the edges of the settlement, the Elliot estate which contains the developments and the Kirkton Industrial estate to the north of the proposed development. These areas form the boundary between the settlement and the surrounding countryside. The buildings and area tending to be lower quality than the surrounding areas of townscape. Buildings are matt concrete or steel and vary in size and height depending on the use from one storey garages and storage units to the significantly larger scale Maltings Plant on the Elliot estate.</p> <p>This character is considered to be of low sensitivity, as an area of business use, the areas tend to be concrete, with little or no vegetation and are defined by their use as working areas of the settlement. Overall the magnitude of change would be <b>low</b> and the overall level of effect would be <b>moderate</b>, indirect, negative and reversible.</p>

## 7.7 Assessment of Visual Effects

Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the development on views, and the general visual amenity. The assessment has been conducted in periods of fine weather and assumes good visibility and limited seasonal leaf cover.

### ZTV and Visual Receptors

A blade tip ZTV is illustrated in **Figure 7.5** and indicates the maximum potential visibility of the wind turbine, assuming there are no trees, woodland or buildings within the area (i.e. a bare earth scenario). It is likely that this visibility would be reduced further by the screening effect of trees, woodland, and buildings on the ground, particularly in relation to settlements.

The pattern of ZTV coverage is influenced by the larger scale topography to the north-west and west of the development, with the landscape becoming more elevated as it rises from the Dipslope Farmland into the Igneous Hills which restricts visibility in these directions. The most prominent areas of visibility would be in the immediate ~5km around the site, with visible areas spreading out over the coast and sea to the south-east, with a small scattering

of theoretical visibility to the north and theoretical visibility over the eastern coast of Fife. **Figure 7.6** illustrates the ZTV in a more detailed fashion, divided into six sections, each focusing on a different part of the study area.

The key visual effects to be addressed include the following:

- Visual effects on the views experienced by local communities;
- Visual effects on the views experienced by users of footpaths and general recreational areas/ tourist destinations; and
- Visual effects on the views experienced by road users along the main transport routes.

### Viewpoint Analysis

Viewpoint analysis has been undertaken for each of the viewpoints and is provided below. A summary of the results of the viewpoint analysis is provided in **Table 7.11** and this analysis reveals that Major or Major / Moderate visual effects are predicted from five of the sixteen viewpoints. These effects were found from the areas closest to the proposed turbine and the more elevated locations within the settlement of Arbroath. **Table 7.12** presents detailed analysis for each site.

**Table 7.11 - Summary of Viewpoints Analysis**

Location	Assessment			Distance from Development
	Sensitivity	Magnitude	Overall Impact	
1. Queens Drive Arbroath	High	Medium	<b>Major / Moderate</b>	Viewpoint located at ~1.4km distance
2. Elliot Bridge	High	High	<b>Major</b>	Viewpoint located at ~700m distance
3. Arbirlot Road West	High	Medium	<b>Major / Moderate</b>	Viewpoint located at ~1.0km distance
4. Boulzie Hill	High	Medium	<b>Major/Moderate</b>	Viewpoint located at ~2.8km distance
5. Bearfauld Road	High	Low	<b>Moderate</b>	Viewpoint located at ~4.2km distance
6. East Haven	High	Low	<b>Moderate</b>	Viewpoint located at ~4.8km distance
7. A92, Salmonds Muir	Medium	Low	<b>Moderate/Minor</b>	Viewpoint located at ~4.0km distance
8. Patrick Allan Fraser Street	High	High	<b>Major</b>	Viewpoint located at ~420m distance
9. Firthfield	High	Low	<b>Moderate</b>	Viewpoint located at ~4.1km distance
10. Braeside	High	Low	<b>Moderate</b>	Viewpoint located at ~2.8km distance
11. A933 Montreathmont	Medium	Negligible	<b>Minor</b>	Viewpoint located at ~11.5km distance
12. Dodd Hill	High	Negligible	<b>Moderate/Minor</b>	Viewpoint located at ~16.6km distance
13. Turin Hill	High	Negligible	<b>Moderate/Minor</b>	Viewpoint located at ~17.1km distance
14. Tentsmuir	High	Negligible	<b>Moderate/Minor</b>	Viewpoint located at ~19.1km distance
15. St Andrews	High	Negligible	<b>Moderate/Minor</b>	Viewpoint located at ~25.5km distance
16. White Caterthun	High	Negligible	<b>Moderate/Minor</b>	Viewpoint located at ~26.9km distance

### Visual Effects during Operation

Post-construction and during operation, the appearance of the wind turbine site would recover a calmer visual character with negligible levels of maintenance activity visible on site from the nearest visual receptors. These effects would largely be indistinguishable from the day-to-day operations of the Maltings.

The visibility of the turbine, however, would extend over the study area affecting a range of visual receptors including residents, road users, tourists, and people undertaking recreational activity. The visual effects of the wind turbine on views and visual amenity during operation are assessed in the following sections.

### Visual Effects on Settlements

#### *Arbroath*

Effects on Arbroath have been considered in detail within both the Townscape Assessment (**Table 7.8**) and within the Viewpoint Analysis (**Table 7.11**). The Townscape Assessment assesses the wider impacts of the turbine on the character of different areas of the town, whilst the Viewpoint Analysis assesses specific locations within these character areas. Viewpoints 1, 2, 3, 4, 5 and 8 are located within Arbroath and demonstrate the different impacts of the proposed turbine from different locations throughout the town.

#### *Other settlements*

Many of the settlements within the study area will gain very limited, or no views of the wind turbine due to the concentration of buildings and other urban features and the landform of the area. Of the 10 settlements that were assessed (including Arbroath), four of these are not covered by the ZTV and will therefore receive no views of the development. Settlements that have been predicted to receive views are likely to only get views of the development from open areas, prominent hill tops within settlements and from settlement edges, as it is likely that woodland and the built environment will screen outward views.

#### Other settlements

**Table 7.12 - Visual effect on settlements within the ZTV**

Settlement	Distance	Visual Assessment
<b>Settlements &lt;5km from Bairds Malt Wind Turbine</b>		
Arbroath		Considered separately within the Townscape and Viewpoint Assessments.
Arbirlot	1.7km	<p>The small hamlet of Arbirlot is situated 1.7km to the west of the proposed development. The ZTV indicates overall visibility across the whole settlement. However, the settlement is bound by bands of mature woodland which run alongside the Elliott Water which runs by the settlement on its way towards the coast. These areas of woodland enclose the settlement to the east and would screen any potential views for the majority of the residents of Arbirlot. Exiting the settlement to the north-east, the road begins to gain altitude and there may be some views of the proposed turbine over the surrounding tree line from this area of the settlement. From this area the visible portion of the turbine would be viewed solely against the sky.</p> <p>Overall the magnitude of change for the settlement is considered to be low which would result in a <b>moderate</b> level of effect.</p>
<b>Settlements between 5-10km from Bairds Malt Wind Turbine</b>		

Settlement	Distance	Visual Assessment
Carnoustie	6.8km	<p>The settlement of Carnoustie is situated 6.8km to the south-west of the proposed development on the Angus Coastline. The ZTV indicates an area of theoretical visibility over the north-eastern edge of the settlement. Views from this area are extremely limited with only the blade tip of the proposed turbine theoretically visible over the horizon. In reality these views would be further reduced by the intervening landscape features such as woodland and other shelterbelts. It is not predicted that there will be any significant impacts on the settlement of Carnoustie.</p> <p>Overall the magnitude of change for the settlement is considered to be negligible which would result in a <b>moderate/minor</b> level of effect.</p>
Redford	6.8km	<p>The settlement of Redford is situated 6.8km to the north-west of the proposed development. The ZTV indicates theoretical visibility from the whole settlement. Where visible the turbine would appear back dropped by the surrounding landscape and the sea. The intervening landscape screens most of the turbine tower from view leaving only the hub and blades visible. With the landscape containing shelterbelt trees and other woodland features would limit any potential views of the development from the edges of the settlement. The remainder of the settlement would experience no views, with the built features screening outward views to the south-east.</p> <p>Overall the magnitude of change for the settlement is considered to be negligible which would result in a <b>moderate/minor</b> level of effect.</p>
Greystone	8.6km	There are no views of the proposed development from this settlement.
Friockheim	9.7km	There are no views of the proposed development from this settlement.
<b>Settlements between 10-15km from Bairds Malt Wind Turbine</b>		
Guthrie	11.4km	There are no views of the proposed development from this settlement.
Monikie	11.7km	<p>The settlement of Monikie is situated 11.7km to the west south-west of the proposed development. The ZTV indicates theoretical visibility across the majority of the settlement. Potential views of the development from within the settlement are extremely limited with only the blade tips theoretically visible from this area. The settlement is located next to the Monikie Reservoirs which are heavily wooded on the western edges, screening views of the nearby reservoir from within the settlement. It is not expected that there will be any views of the development from within the settlement.</p> <p>Overall the magnitude of change for the settlement is considered to be negligible which would result in a <b>moderate/minor</b> level of effect.</p>
Letham	12.1km	There are no views of the proposed development from this settlement.
Monifieth	13.4km	<p>The settlement of Monifieth is situated 13.4km to the south-west of the proposed development. The ZTV indicates an area of theoretical visibility over the northern part of the settlement. At this distance the majority of the potential views would be limited by the surrounding built features within the settlement with theoretical views limited to the edges of the settlement. At this distance the potential views of the development are limited to the very tips of the blades, when considering features in the intervening landscape such as shelterbelt woodland other man made features associated with farms it is unlikely that there will be any views of the development from within the settlement.</p> <p>Overall the magnitude of change for the settlement is considered to be negligible which would result in a <b>moderate/minor</b> level of effect.</p>

**Settlements beyond 15km are unlikely to experience any significant effects**

### Visual Effects on Residential Properties

A total of sixty three properties within a radius of 2km of the turbine have been included in the Residential Assessment. These have been broken down into twenty four clusters or individual properties, as shown in **Table 7.13**. These include properties located on the all sides of the proposed development. The assessment has looked at the theoretical visibility in conjunction with the properties' primary and secondary views as well as views from the garden area, taking into account any vegetation or woodland which may surround the



property. A summary of the assessment of all residential properties within 2km of the nearest turbine is provided in **Table 7.13** and the full assessment can be found in **Appendix 2.2**.

**Table 7.13 - Predicted Visual Effects on Residential Properties**

Property	Distance	Magnitude of Change	Level of Effect
1. Peasiehill Farm Cottages	330m	High	Major
2. Peasiehill Farm House	650m	Medium	Major/Moderate
3. Peasiehill Farm Bungalow	720m	Medium	Major/Moderate
4. Krojan Cottages	700m	Medium	Major/Moderate
5. Crudie Farm House	810m	Medium	Major/Moderate
6. Crudie Farm Cottages	920m	None	None
7. Elliot Cottages	580m	High	Major
8. Elliot Bridge	685m	Negligible	Moderate/Minor
9. Elliot	630m	None	None
10. A92 Cottages	1.3km	Low	Moderate
11. Willow Cottage	1.1km	Low	Moderate
12. Balcathie Farm Cottages	1.1km	Low	Moderate
13. Balcathie Farm	1.2km	Negligible	Moderate/Minor
14. Grahamston Cottages	1.7km	Negligible	Moderate/Minor
15. Kellie Castle Lodge	1.7km	Negligible	Moderate/Minor
16. The Manse Cottage	1.8km	None	None
17. The Glebe House	1.7km	None	None
18. Bank	1.3km	Low	Moderate
19. Broomhill	1.5km	Negligible	Moderate/Minor
20. Loanend	1.8km	Negligible	Moderate/Minor
21. Fairyknowe	1.4km	Medium	Major/Moderate
22. Bankhead	1.9km	Negligible	Moderate/Minor
23. Crudie Acres	1.6km	Low	Moderate
24. Bottlend Cottages	1.7km	Negligible	Moderate/Minor

In summary, out of the receptors detailed in **Table 7.11** two are predicted to experience major effects. These are Peasiehill Farm Cottages, the closest properties to the Maltings which are owned by the landowner of the field to the west of the Maltings who is a financially interested party. Elliot Cottages are the other receptor predicted to experience a major effect, with the properties receiving views of the turbine from the rear rooms and gardens.

A further five receptors are predicted to experience major/moderate effects, which tend to occur within 1km of the proposed turbine. These effects would be in relation to views from the primary windows and garden areas, although it should be noted even when visible the turbine is never an overbearing feature and is not assessed as constituting an unacceptable change to the quality of living for the residents. Outwith 1km, potential effects were found to be diminished.

Where visible from these more rural areas to the south and west of the proposed development the turbine would appear in the view alongside the industrial workings associated with the Maltings Plant. It would be viewed as an industrial feature alongside the man-made features already present in the view, and would not open up any other areas of visibility or limit views towards the coastline where these occur from the more elevated locations to the west.

## **7.8 Assessment of Major Tourist and Transport Routes**

An assessment of the potential for visual effects from selected routes within the study area has been undertaken. These routes are:

- A92 – Monifieth to Montrose.
- A933 – Arbroath to Colliston.
- Core Paths 151 & 152

### ***A92 Monifieth to Montrose***

The A92 is the coastal route between Dundee and Stonehaven, following the nearby coastline offering a more scenic alternative to the A90 which runs through the neighbouring countryside. The section of the route assessed runs from Monifieth in the south to Montrose in the north, travelling amongst the fairly flat farmland that flanks the western side of the road there are often open and long distance views over the coastline to the east. The intervening landscape features and the gently rolling topography present within the wider farmland to the west often limit longer distance views. The route travels on a generally north-east/south-west trajectory for the whole of the assessed section. The road passes through or close to Monifieth, Carnoustie, Arbroath and Montrose as well as several individual farms which are generally located away from the roadside. At its closest point the route is 600m distance from the proposed turbine. The section assessed runs for ~38km and is considered to be of medium sensitivity, as a busy transport route.

The ZTV indicates the turbine will first come into view for north bound traffic as the south passes by Monifieth. The turbine is heavily screened by the intervening landscape over this section of the route, with only the blade tips theoretically visible. These views would be screened by the intervening vegetation and other features present in this view. The turbine disappears from view for ~4km, screened completely from view by the surrounding landscape. As the route approaches Muirdrum the ZTV indicates the turbine will again become visible, remaining in the view over the next ~6km as the route approaches Arbroath.

The turbine will appear in front of the road user as they make their way towards Arbroath. **Viewpoint 7** was taken from the side of the A92 at Salmonds Muir and represents a typical view along this section of the road. Approaching Arbroath the turbine will become a more prominent feature in the view due to its location on the south-western edge of the settlement. The visible portion of the turbine would be viewed against the sky, with the lower sections screened by the intervening buildings. On approach to Arbroath the woodland around Elliot would limit views for a short time, as the views towards the turbine become more oblique. As the route arrives in Arbroath the turbine passes to the rear of the view.

Travelling south from Montrose the turbine first comes into view as the road passes by Upper Dysart, the turbine would not be an obvious feature from this location, heavily screened by the intervening built features, these views would occur for ~2km before the turbine is again screened from view by the surrounding landscape, the turbine remains hidden from view for ~7km reappearing to the north-east of Arbroath. The views on approach to Arbroath would be similar to those in **Viewpoint 5** although the A92 is slightly lower lying than the more elevated viewpoint location. On approach to Arbroath views would become increasingly screened by the built environment. Travelling through Arbroath views would become screened for a time. As the route passes by the football ground the views again open towards the coast, as the developed areas of the settlement pass to the rear of the view, the turbine would become visible for a short section of the road upon leaving Arbroath views would become quickly oblique as the route passes by Elliot Bridge the turbine passes to the rear of the view.

The magnitude of change for the route as a whole would be **medium**, resulting in a **moderate/minor** level of effect.

### ***A933 Arbroath to Colliston***

The A933 runs from Arbroath to Brechin, linking the coastal settlement with the A90 which runs both north and south. The section of the route assessed runs from Colliston to Arbroath. The route runs through a predominantly flat agricultural landscape, with large rectilinear fields flanking both sides of the route. Shelterbelt woodland peppers the landscape and at times the roadside. The section assessed runs for ~6km and is considered to be of medium sensitivity, as a local transport route.

The route turns off the A92 on the western south-western edge of Arbroath, travelling past the industrial estate and the proposed turbine, views of the turbine would be partially screened by the intervening buildings at the Maltings with the visible portion of the turbine viewed against the sky. Views of the turbine would occur for ~500-600m before the turbine moves to the rear of the view.

Travelling from Colliston towards Arbroath, the ZTV indicates that the turbine will come into view almost immediately, remaining in the view for the whole route into Arbroath. Despite this views of the turbine would be extremely limited the majority of the route is screened by roadside shelterbelt woodland, particularly around the disused Airfield. As the route enters Arbroath views would become increasingly intermittent with the built environment offering

a great deal of screening of the proposed turbine. As the route approaches the A92 the turbine would pass to the rear of the view.

### ***Core Paths 151 & 152***

There are a number of Core Paths within this area of Angus, with two paths passing close to the proposed Baird Malt site. These are Core Path 151 which passes between Elliot and Arbirlot and Core Path 152 which runs from Elliot towards Peasihill Farm and the B9127. The Core Paths are considered to be of high sensitivity

Path 151 follows the route of a disused railway line and the path of the Elliot water. Its route is heavily wooded with some open views over the open section of the path towards the maltings and the caravan site in the land adjacent to the industrial estate. The turbine would appear in these views for a short time. Travelling towards Arbirlot on the path the views would become quickly screened by the dense mature woodland which surrounds the river banks. The magnitude of change for the route as a whole would be **low**, resulting in a **moderate** level of effect.

Path 152 passes to the west of the Maltings and the Hospitalfield industrial estate. Views of the proposed turbine would occur regardless of direction of travel over the whole section of the path, with the turbine appearing amongst the industrial units. The magnitude of change for the route as a whole would be **high**, resulting in a **major/moderate** level of effect.

## ***7.9 Assessment of Cumulative Visual Effects***

### **Wind Energy Development Included in the CLVIA**

The cumulative assessment includes existing wind energy developments (those operating or under construction), proposals with planning permission, and those that are currently the subject of undetermined applications within a 60km radius of the Bairds Malt Wind Turbine site. Other known pre-application wind energy development proposals have been identified as part of the assessment process and considered in outline only, due to the more limited information available in connection with these proposals.

For the purpose of the assessment, consideration was given to turbines over 50m to blade tip, as in line with SNH guidance.

The list of other wind energy development sites to be included in the assessment has been confirmed with Angus Council and SNH and compiled from known wind energy development planning applications and formal requests for scoping opinions held by the various planning authorities.

All wind energy developments included or referred to in this assessment out to 60km are illustrated on a plan in **Figure 7.7**. Listed below in **Table 7.14** are the key projects, within 15km of the development which are likely to have some level of cumulative impact with Bairds Malt Wind Turbine, potentially appearing simultaneously or successively in views.

**Table 7.14 - Summary of key Wind Energy Projects within 15km (Cumulative Study Area)**

Development Name	Scale of Project (Single turbine, Cluster or Wind farm)	Tip Height (m)	Distance to Project (approx. in km)
<b>Operational Projects</b>			
North Mains of Cononsyth	Single Turbine	67m	8.1km
Pickerton	Single Turbine	84.5m	13.2km
<b>Consented Projects</b>			
Cuthlie	Single Turbine	77m	4km
Ascurry	Single Turbine	77m	10.5km
Greenhillock	Single Turbine	67m	13km
Stotfaulds	Single Turbine	77m	12.5km
<b>Projects in Planning</b>			
Crofts Farm	Cluster	80m	6km
Montquhir	Single Turbine	77m	8km
Upper Balmachie	Single Turbine	77m	8.5km
Dubton Farm	Single Turbine	77m	13km

Two or more wind developments are required for the occurrence of a cumulative visual effect. This assessment has therefore considered the development of Bairds Malt Wind Turbine in addition to the other wind farm sites in the landscape in order to test the landscape capacity of the area and provide conclusions for the CLVIA relevant to this proposal.

**Figure 7.7** shows the location of all of the wind development currently operational, consented and in planning within a 60km radius of the proposed turbine at Bairds Malt Wind.

From this overall picture, it can be seen that the majority of operational developments in the area occur in the Igneous Hills landscape to the west of Bairds Malt Wind Turbine. Ark Hill and Scotston Hill are examples of this. Outwith Angus, larger scale developments are more common and are mostly located within Upland type landscape and spread out across the area. To the west, the larger wind farm of Drumderg sits within the upland landscape, while Tullo is situated to the north east. In the areas to the south and south-west of the proposed development, projects tend to be smaller scale clusters and single turbines. The Bairds Malt Wind Turbine would fit into the existing pattern of development across the Dipslope Farmland.

A series of potential cumulative ZTV's (based on submission status) is illustrated in **Figure 7.7** showing the potential cumulative ZTV for each of the key wind farms. The findings from the analysis of the cumulative visibility maps and cumulative viewpoint assessment have been used to form a conclusion as to the level of overall cumulative visual effects during operation as experienced by various receptors.

### Cumulative Viewpoint Assessment

Each viewpoint assessed as part of the viewpoint assessment has also been considered cumulatively with all other wind energy projects identified within the 60km cumulative study area. A summary of potential cumulative visibility assessment from each of the

viewpoints is provided in **Table 7.15**. Further detail can be found in the viewpoint assessment located in **Appendix 2.1**.

**Table 7.15 - Summary of Cumulative Viewpoint Analysis**

Viewpoint No.	Sensitivity	Magnitude	Level of Effect
<b>Viewpoint 1: Queens Drive Arbroath</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 2: Elliot Bridge</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 3: Arbirlot Road West</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 4: Boulzie Hill</b>			
Bairds Malt Wind Turbine and Operational Wind farms		■ -	■ -
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 5: Bearfauld Road</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 6: East Haven</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 7: A92, Salmonds Muir</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	Medium	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 8: Patrick Allan Fraser Street</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 9: Firthfield</b>			

Viewpoint No.	Sensitivity	Magnitude	Level of Effect
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 10: Braeside</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 11: A933 Montreathmont</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	Medium	-	-
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		-	-
<b>Viewpoint 12: Dodd Hill</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 13: Turin Hill</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 14: Tentsmuir Recreational Area</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor
<b>Viewpoint 15: St Andrews</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Low	Moderate
<b>Viewpoint 16: White Caterthun</b>			
Bairds Malt Wind Turbine and Operational Wind farms		Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented Wind farms	High	Negligible	Moderate/Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Moderate/Minor

### Cumulative Assessment of Major Tourist and Transport Routes

An assessment of the potential for cumulative effects from all major routes within the study area has been undertaken and includes the following:

- A92 – Monifieth to Montrose.



- A933 – Arbroath to Colliston.
- Core Paths 151 & 152

A summary of significance of impact is outlined in **Table 7.16** at the end of the assessment.

### ***A92 Monifieth to Montrose***

#### *Operational*

There are no significant cumulative views with any operational developments when travelling in either direction along this section of the A92. The cumulative magnitude of change when considering operation projects is **none**.

#### *Consented*

There may be some oblique views towards the Cuthlie turbine to the left of the roadside on approach to Arbroath although these views are likely to be subject to some screening from localised vegetation.

The cumulative magnitude of change when considering consented projects will become **negligible**.

#### *In Planning*

Cumulative views between Upper Balmachie and Bairds would be limited as the Bairds Malt turbine is not an overly prominent feature over this section of the route. Similarly is also visible over this section of the route, located to the west of the road. The Upper Balmachie turbine would appear simultaneously with the Bairds malt turbine intermittently visible in the distance. As the turbine move to the rear of the view, the Bairds Malt turbine will begin to come into view. Travelling south from Montrose there are no significant cumulative effects between Bairds and any planning development. The cumulative magnitude of change will remain **negligible**.

### ***A933 Arbroath to Colliston***

#### *Operational*

There are no significant cumulative views with any operational developments when travelling in either direction along this section of the A92. The cumulative magnitude of change when considering operation projects is **none**.

#### *Consented*

The Cuthlie turbine is obliquely visible as the route leaves Colliston, quickly passing to the rear of the view, and there would be no significant cumulative effects with the Bairds malt turbine. The cumulative magnitude of change when considering consented projects will remain **negligible**.

#### *In Planning*

The Montquhir and Upper Balmachie turbines all appear in the same general view for ~1.5km as the route approaches Arbroath, however, this section of the route is heavily wooded and views of the more distant turbines are unlikely to occur as the Bairds malt

turbine is also likely to be heavily screened in these areas. The cumulative magnitude of change will remain **negligible**.

### ***Core Paths 151 & 152***

There are no cumulative effects on the Core Paths.

**Table 7.16 - Summary of Cumulative Viewpoint Route Analysis**

<b>Route</b>	<b>Sensitivity</b>	<b>Magnitude</b>	<b>Level of Effect</b>
<b>A92 Monifieth to Montrose</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	Medium	Negligible	Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Minor
<b>A933 Arbroath to Colliston</b>			
Bairds Malt Wind Turbine and Operational Wind farms		-	-
Bairds Malt Wind Turbine and Operational, Consented Wind farms	Medium	Negligible	Minor
Bairds Malt Wind Turbine and Operational, Consented, Planned Wind farms		Negligible	Minor

## ***7.10 Summary of Assessment Conclusions***

### **Introduction**

The proposed Bairds Malt Wind Turbine is located within the Maltings within the Hospitalfield Industrial Estate on the south-western edge of Arbroath. The area forms part of the urban fringe of Arbroath and would sit alongside various other industrial features, primarily the Maltings.

### **Landscape Design**

The project includes a single wind turbine with a hub height of 55m and a maximum tip height of 77m. The turbine size, layout and location have been proposed to fit alongside the existing infrastructure on the site including the drying towers associated with the maltings.

The associated infrastructure including substation has been located sensitively to minimise visual impact. There will be no significant effects resulting from the construction and operation of the associated infrastructure, although negative effects are anticipated during the temporary construction period. These would be restored and mitigated on completion of the construction period.

### **Townscape/Landscape Assessment**

The proposed Bairds Malt Wind Turbine is located within urban fringe of Arbroath, within the Elliot Industrial Estate adjacent to the Dipslope Farmland Landscape Character Area, and would affect a proportion of part of this area. As an urban area on the edge of this character area, which is heavily man-modified and busy with activity, there would be very little direct effects on the character, although there would be indirect effects relating to its visibility across the landscape character area to the south-west and west.

Considering the wider area, the assessment has concluded that there would be no significant indirect effects from any of the other landscape character areas within the study area.

The proposed turbine is located within an industrial zone on the south-western edge of Arbroath. The turbine appears predominately in views alongside the Maltings Plant infrastructure and would be seen alongside these industrial features already present within the view. The turbine may appear slightly more prominent in vertical scale, however, it will fit well with the industrial cladding of the buildings in the surrounding landscape.

Considering the wider area, the assessment has concluded that there would be no significant indirect effects from any of the other landscape character types or within the study area.

#### *Effects on Designated Landscapes*

The landscape of the site area is not designated and as such there will be no direct effects of any designated landscape and any effects would be as a result of indirect landscape effects from designated areas within the study area. The assessment has concluded that there would be no significant indirect landscape effects on designated landscape areas including Areas of Great Landscape Value, Special Landscape Areas and Gardens and Designed Landscapes.

#### **Visual Assessment**

The viewpoint analysis is contained in **Appendix 2.1** and indicates that there would be no Major or Major / Moderate visual effects occurring beyond ~3km from the proposed turbine. The conclusions from the viewpoint assessment have been used to form a view as to the level of overall visual effects within the study area.

#### *Visual Effects: Construction Period*

There will be no significant visual effects resulting from the construction period and visibility of the ground based activity. Views of concentrated areas of construction could however lead to a temporary and negative effect that in some cases may appear more disruptive than the finished development. Post construction, the appearance of the site would recover a calmer visual character with negligible levels of activity visible on site from the nearest visual receptors.

#### *Visual Effects: Operational Period*

Views of the proposed turbine would be limited from within the neighbouring settlement of Arbroath. The turbine appears as part of the skyline from some of the more elevated open locations within the settlement, appearing in views alongside the Maltings Plant. The two developments appear similar in type with the turbine a fairly industrial feature, similar in colour to the concrete and metal cladding that makes up the Maltings Plant buildings. The majority of the settlement will gain little or no views of the proposed development with the majority of the residential areas located to the north and west of the settlement. The vegetation and built features which surround these areas screening potential views. The neighbouring Hospitalfield housing estate will experience some views from the areas around

the properties, with the turbine appearing alongside the Maltings Plant which is already an easily discernible feature in the views from these more open areas around the housing scheme.

### **Cumulative Landscape and Visual Effects**

The Bairds Malt Wind Turbine would rarely be seen in conjunction with other wind developments. The nearest operating turbine is located over 6km inland from the coastal settlement of Arbroath, with the nearest consented development over 10km from the settlement.

#### *Certain Impact*

Considering the introduction of the proposed Bairds Malt Wind Turbine development and the effects it will have on operational developments within the study area, it is considered that the overall level of cumulative effect due to Bairds Malt Wind Turbine would be negligible.

#### *Likely Impact*

Considering the introduction of the proposed Bairds Malt Wind Turbine development and the effects it will have on operational and consented projects in the study area, it is considered that the overall level of cumulative effect due to Bairds Malt Wind Turbine would remain negligible.

#### *Uncertain Impact*

In addition to the above, when considering all the currently planned wind energy developments, the impact of Bairds Malt Wind Turbine would remain negligible.

### **7.11 Summary of Effects**

It is concluded that the addition of a single turbine to the industrial zone on the south-western edge of Arbroath would have some potentially significant effects, relating to some of the nearest residential receptors, views from some areas of Arbroath and from five of the sixteen viewpoints. While views from some of the residential properties are deemed significant, the impact would not be unacceptable and although prominent in views the turbine would not be an overbearing feature which dominates the receptor nor would it be an overbearing structure that is consistently visible. The turbine appears in views which already contain strong industrial elements from the neighbouring maltings and does not open up any new areas of visibility that may be deemed as scenic or picturesque.

Typically the turbine is visible along with the infrastructure associated with the Maltings which has been a feature of the skyline in Arbroath for over 40 years. The turbine relates well to the scale of the surrounding buildings and would add a vertical feature to the views which already contain several industrial elements, and take up only a small extent of the horizontal view. As well as the vertical scale, the turbine will fit well with the industrial nature of the buildings with a similar colour palette. These effects are fairly localised occurring within 2-3km of the turbine, with much of the settlement remaining free from views due to the built up nature of the settlement.

The turbine would be introduced to an industrialised area of the local landscape which is defined by the maltings operation on site. The addition of a 77m wind turbine to these features will have a low level of impact from a landscape and visual perspective when consider within the wider townscape and landscape setting.

## 8 Noise

### 8.1 Introduction

This noise assessment has been carried out in accordance with the recommendations of *ETSU-R-97, The Assessment and Rating of Noise from Wind Farms* and more recent guidelines issued by the Institute of Acoustics in 2009 and 2013<sup>3</sup>. Detailed predictions of the operational noise of the Enercon E44 turbine, the candidate turbine model of the proposed development, have been made and compared with the measured background noise levels used to derive noise related constraints for the project. Using this data, an assessment of the likelihood of the project meeting derived noise limits has been undertaken.

The site is unusual for a wind development in that it includes urban and industrial areas. The approach developed for this assessment was therefore the result of a six month period of consultation with Angus Council Environmental Health who offered guidance at each stage of the process. Rather than assess the proposed development as an additional on-site process at Bairds Malt (BS 4142), the Council preferred that an ETSU-R-97 noise assessment be conducted and that measured noise levels be referenced to wind speeds derived from a hub height wind speed measurement.

A preliminary assessment was conducted to identify the source, position, sound power and pattern of use, of the most significant noise producing processes on-site at Bairds Malt<sup>4</sup>. This consisted of a number of attended noise measurements across the site and over the six month period. Unattended noise measurements were also made at two locations identified as having the potential to be the most noise sensitive; these measurements were made during a three week period when on-site activity was at an annual minimum.

Following this, a background noise survey has been carried out at four properties representative of the nearest noise sensitive receptors, to establish noise related planning conditions for the proposal, should it be consented. Given the relatively high number of potential noise receptors, particular care was taken in ensuring that noise monitoring equipment was placed in positions likely to measure the quietest background noise levels in each location. These locations were agreed in advance with Angus Council Environmental Health who oversaw the deployment of noise monitoring equipment as the survey got underway. The survey equipment was deployed on the 15<sup>th</sup> January 2014 and remained for a period of approximately four weeks.

### Terminology

The symbols used for noise levels in this report are:

- $L_{WA}$  is the A-weighted sound power level – a measure of the total sound energy emitted by a source of noise;

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<sup>3</sup> Institute of Acoustics, '*Prediction and assessment of wind turbine noise – agreement about relevant factors for noise assessment from wind energy projects*', Acoustics Bulletin, March/April 2009; and, Institute of Acoustics, "*A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise*" — issued 05-2013

<sup>4</sup> The positions and patterns of use of the most significant noise sources at Bairds are shown at Appendix 1

- $L_{A,eq}$  is the A-weighted equivalent continuous sound pressure level, which is a measure of the total ambient noise at a given place at a given time; and
- $L_{A90,10min}$  is the A-weighted sound pressure level exceeded for 90 percent of the time in the averaging time period specified – in this case 10 minutes – and is the index most widely used for background noise level measurements.

ETSU-R-97 states that the  $L_{A90,10min}$  noise descriptor should be adopted for the noise assessment and the more recent IoA guidance indicates that 2dB (A) should be subtracted from  $L_{A,eq}$  values when converting them to  $L_{A90,10min}$  values. The wind speeds referred to in this report are:

- $v_{10}$  wind speeds are standardised 10m wind speeds. All background noise, turbine sound power levels and predicted turbine noise levels are quoted with reference to standardised 10m wind speeds. These were derived from wind speeds measured at 55m height above ground level (hub height) and extrapolated to 10m wind speeds assuming a standard wind profile.
- $v_h$  wind speeds are hub height wind speeds measured directly with a LiDAR device located adjacent to the proposed turbine location and used to extrapolate to  $v_{10}$  wind speeds.

## Guidance

### *Potential impacts*

Noise can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The impact of noise can therefore be a material consideration in the determination of planning applications. Noise impacts can arise from three distinct areas of the wind farm development:

- The construction of the wind turbine;
- During operation of the wind turbine; and
- Resulting from increased traffic flow during the construction and operation stages.

Given the scale of the development, it is anticipated that construction noise will be short term and in the most part will not increase background noise levels beyond the recommended limits set out by the World Health Organisation and the former Department of the Environment.

### *National guidelines*

Guidance for assessing operational noise from wind farms is given in:

- 'ETSU-R-97: the Assessment and Rating of Noise from Wind Farms (1997)'; The Department of Trade and Industry. (usually referred to as the Noise Working Group Recommendations); and

The Institute of Acoustics (IoA) has since provided clarity on requirements for noise assessment of wind turbines in an attempt to encourage a standardised approach to this type of measurement:



- ‘Prediction and assessment of wind turbine noise – agreement about relevant factors for noise assessment from wind energy projects’, Acoustics Bulletin, March/April 2009, IoA
- More recently; ‘A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise’, May 2013, IoA; and the related Supplementary Guidance Notes that followed.

### *Noise limits*

In September 1996, the Noise Working Group published its recommendations in ETSU-R-97. The report describes a framework for the measurement of wind farm noise and includes suggested noise limits, derived with reference to existing standards and guidance relating to the emission of noise from various sources existing at that time. The ETSU-R-97 guidelines recommend that wind turbine noise should be limited to an absolute lower limit, of 35 - 40dB(A) [ $L_{A90,10min}$ ] for quiet daytime periods and 43dB(A) for night-time periods, or 5dB(A) above the background noise levels, whichever the greater.

However, following World Health Organisation guidelines on sleep disturbance<sup>5</sup>, a reduced lower fixed limit of 38dB(A) is proposed for night-time periods. A 38dB(A) lower limit is also proposed for quiet daytime periods. Measurement data suggested that the lowest representative backgrounds in the area surrounding Bairds Malt were around 38dB(A)  $L_{A90}$ . A 38dB(A) limit would therefore be justified as industrial noise from the Elliot Industrial Estate (Including Bairds Malt) during amenity hours, raises background noise levels such that the possibility of amenity loss through turbine noise being a margin above background noise, as could occur in quieter locations, is greatly reduced. It is also suggested that where a resident has a demonstrable financial interest in the project, a lower fixed limit of 45dB (A) should apply at that property during both quiet daytime and night-time periods.

The quiet daytime periods (amenity hours), are defined as:

- 18:00 – 23:00 – Monday to Friday;
- 13:00 – 23:00 – Saturdays; and
- 07:00 – 23:00 – Sundays.

Night time periods are: 23:00 – 07:00 each day

## **8.2 Background noise measurements**

Noise monitoring was conducted at four properties to characterise the prevailing background noise environment of the area. Measurements were made between the 18<sup>th</sup> of January and the 20<sup>th</sup> of February 2014. Each of the four residents was provided with a ‘noise diary’ in which they were encouraged to make a note of anything unusual occurring that was audible at their property.

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<sup>5</sup> World Health Organisation, “Guidelines for Community Noise”, p40, 1999

**Location map with 35dB(A) noise contour**

Figure 8.1 shows the location of the proposed wind turbine, the LiDAR and the noise monitoring positions. The noise contour encloses an area where the worst case turbine noise levels are predicted to exceed 35dB(A) [L<sub>A90,10min</sub>]. This contour has been used to define the study area. The prediction assumes downwind conditions.

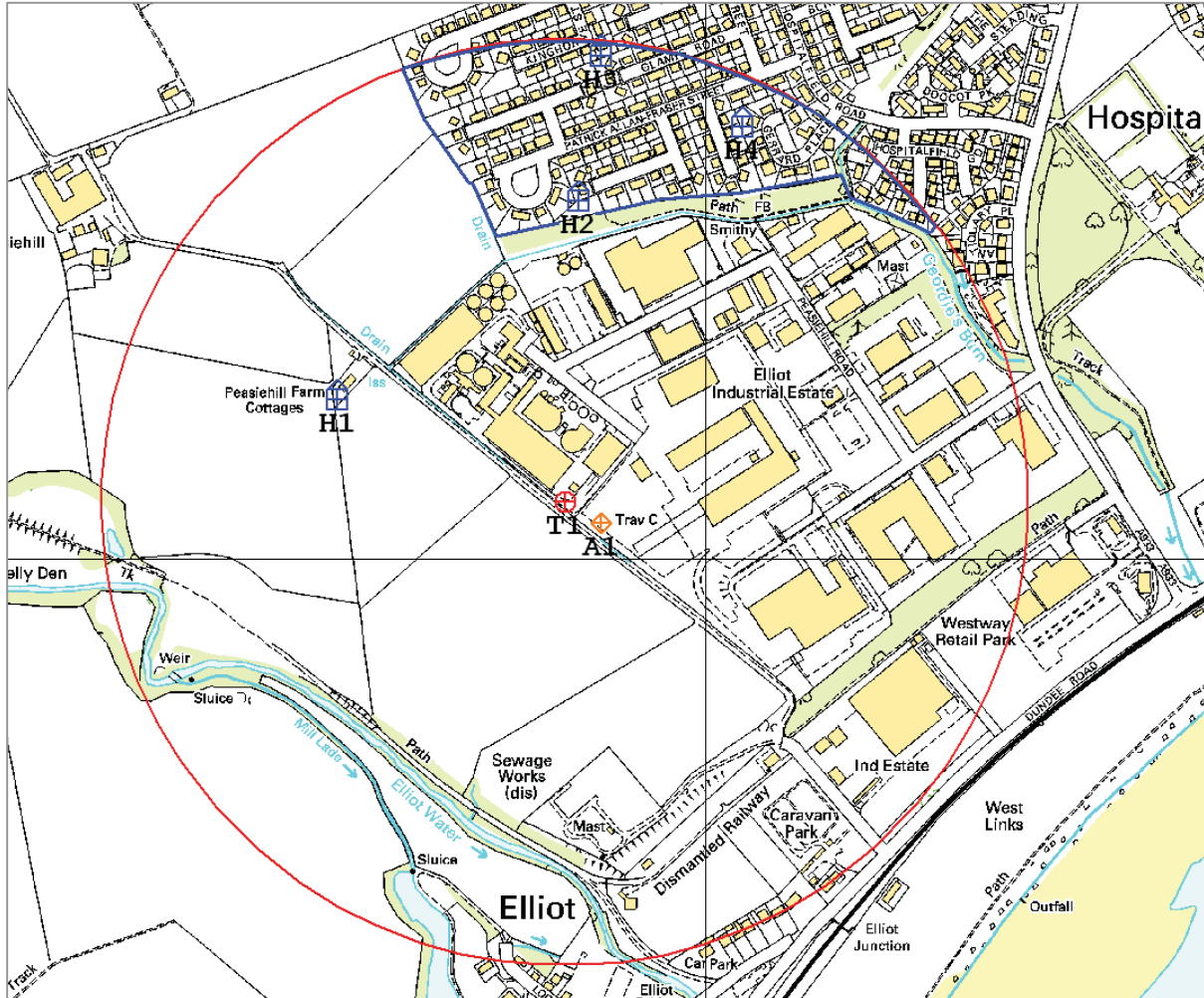


Figure 8.1: Map showing turbine positions and potential noise receptors

**Key:**

Proposed wind turbine: T1 ⊕

LiDAR: A1 ⊕

Noise monitoring positions: Peasiehill Cottages ⊕ H1

Hospitalfield estate ⊕ H2,H3,H4. The blue outline encompasses the potential noise sensitive receptors represented by H2 - 4

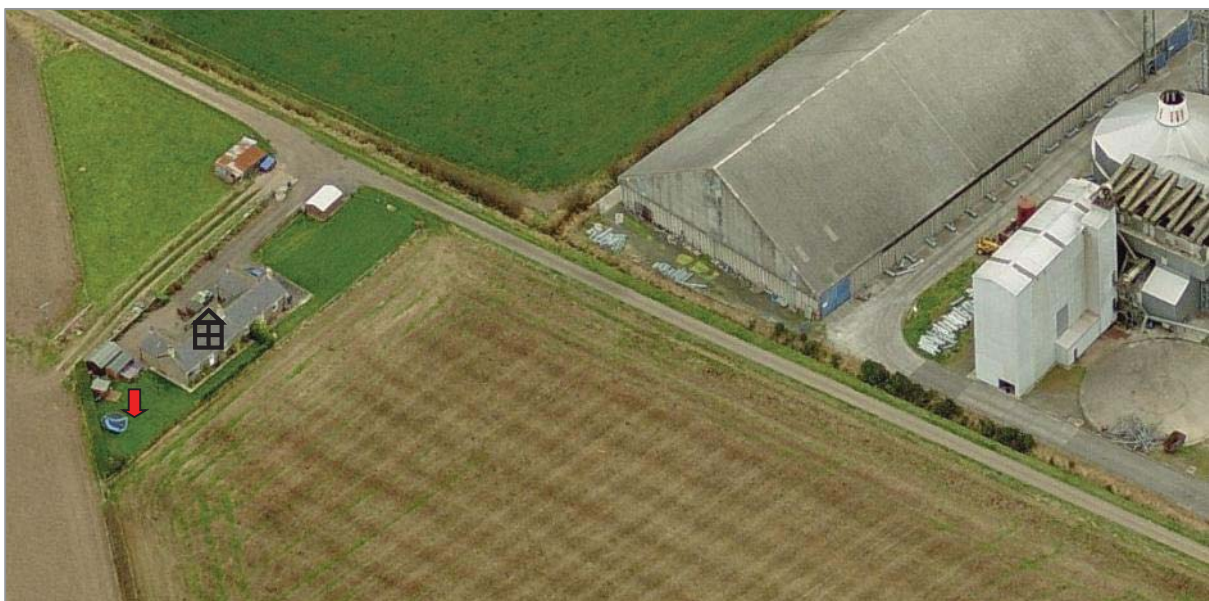
**Noise monitoring location H1**

Peasiehill Cottages form a small terrace to the west of Bairds Malt and north of the proposed turbine position. A suitable monitoring position was located in the amenity area at the west end of the terrace. As many of the most significant noise sources at Bairds are located on its western side, Peasiehill Cottages are the more exposed of the dwellings near Bairds to those sources. Most often these noise sources combine to produce a unified hum

occupying a broad range of frequencies. However, pellet production can intermittently produce a percussive noise that was observed to increase noise levels by between 6dB – 10dB for a period of up to 30 minutes.

Noise sources other than those from Bairds, observed during site visits, were the calls from groups of gulls, distant traffic noise from the A92 that joins Arbroath with Dundee, and the noise from occasional military aircraft.

The monitoring position was sufficiently distant from building facades, vegetation and boiler flues, for these features not to cause artificially elevated noise levels to be measured. **Figure 8.2** shows the monitoring position at Peasiehill Cottages and the western corner of site at Bairds Malt.



**Figure 8.2: Satellite image showing detail at Peasiehill Cottages.**

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#### Key

Monitoring position ↓ Occupied dwellings 🏠

A photograph of the monitoring position in relation to the terrace façade and Bairds Malt is shown in **Figure 8.3**.



**Figure 8.3: Noise monitoring position at Peasiehill Cottages.**

Details of the monitoring equipment used for the assessment is shown in **Table 8.17**.

Equipment List	
Sound Level Meter (IEC 61672-1 Class 1):	<i>Rion NL-31 - Serial No. 01283511</i>
Microphone:	<i>Rion UC-53A - Serial No. 315537</i>
Pre-amp:	<i>Rion NH-21 - Serial No. 29268</i>
Acoustic Calibrator (IEC 60942 Class 1):	<i>Rion NC-74 - Serial No. 34494275</i>
Tripod:	<i>Single integrated pole (1.40m)</i>
Wind Shield:	<i>Double skin Rion WS-03</i>
Environmental Case:	<i>Yes</i>
Measurement GPS position:	<i>361546,740192</i>
Nearest reflecting elements & distances from microphone:	<i>Property façade &gt;10m Shed &gt;8m Fence &gt;6m</i>

**Table 8.17: List of equipment used at Peasiehill Cottages**

### Noise monitoring location H2

Of the four possible locations considered as candidates to represent the dwellings on Patrick Allan Fraser Street nearest to Bairds Malt, this location was chosen as being the most representative. Noise levels at two of the other locations had the potential to be affected by prominent boiler flues and the third was out on the western periphery of the estate and relatively exposed to the prevailing south-westerly winds.

The amenity area at H2 is relatively compact; in order that the measurement position is away from vegetation and more than 3.5m from all significant surfaces, it was placed against a concrete wall, shown in **Figure 8.5**. It was judged that the wall-top area within 3.5m of the microphone was sufficiently small that it would not compromise noise measurements. H2 has shelter from all wind directions, particularly the prevailing south-westerlies.

**Figure 8.4** shows the noise monitoring position at H2. It should be noted that, because the monitoring period was undertaken in January and February, foliage and vegetation generally, was at a minimum.





Figure 8.4: Satellite image including H2 at Patrick Allan Fraser Street.

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**Key**

Monitoring position ↓ Dwelling associated with the monitoring position 🏠

The daytime noise environment at H2 was predominantly broadband industrial noise emanating from both Bairds Malt and the Elliot Industrial Estate in general. This position is the most exposed to the overhead grain conveyors at Bairds which are used intermittently. Photographs of the monitoring position in relation to the property façade and Bairds Malt are shown in Figure 8.5:



Figure 8.5: Noise monitoring position at H2.

Details of the monitoring equipment used at H2 are listed in Table 8.18:

Equipment List	
Sound Level Meter (IEC 61672-1 Class 1):	Rion NL-31 - Serial No. 01283510
Microphone:	Rion UC-53A - Serial No. 315536
Pre-amp:	Rion NH-21 - Serial No. 29267
Acoustic Calibrator (IEC 60942 Class 1):	Rion NC-74 - Serial No. 34494275
Tripod:	Single integrated pole (1.40m)
Wind Shield:	Double skin Rion WS-03
Environmental Case:	Yes
Measurement GPS position:	361843,740432
Nearest reflecting elements & distances from microphone:	Property façade >8m Shed >5m Side wall >5m Adjacent wall-top <3.5m

Table 8.18: List of equipment used at H2

### Noise monitoring location H3

H3 is located on Kinghorne Street which lies to the north of Patrick Allan Fraser Street and is more distant from Bairds Malt and the proposed turbine location. After reviewing a number of potential sites, this location was elected to be the most representative of the dwellings that lie towards the north of the housing estate but within the 35dB(A) noise contour shown in **Figure 8.1**.

The noise environment at H3 was noticeably quieter than H2; industrial noise was much less distinct from the more general hum of what appeared to be distant traffic. The amenity area at H3 is relatively large and is located on its southern and eastern sides. The boiler flue is located on the building's northern side. A suitable monitoring position was located on the south side of the property, more than 10m from a large evergreen shrub and more than 3.5m from all significant surfaces. The monitoring position has shelter from all wind directions. **Figure 8.6** shows a satellite image of H3 at Kinghorne Street.



**Figure 8.6: Satellite image including H3 at Kinghorne Street.**

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#### Key

Monitoring position  Associated dwelling 

Photographs of the monitoring position in relation to the property façade and amenity perimeter in the direction of Bairds Malt is shown in **Figure 8.7**.





**Figure 8.7: Noise monitoring position at H3.**

Details of the monitoring equipment used for the assessment is shown in **Table 8.19**

Equipment List	
Sound Level Meter (IEC 61672-1 Class 1):	<i>Rion NL-31 - Serial No. 00903982</i>
Microphone:	<i>Rion UC-53A - Serial No. 317501</i>
Pre-amp:	<i>Rion NH-21 - Serial No. 33990</i>
Acoustic Calibrator (IEC 60942 Class 1):	<i>Rion NC-74 - Serial No. 34494275</i>
Tripod:	<i>Single integrated pole (1.40m)</i>
Wind Shield:	<i>Double skin Rion WS-03</i>
Environmental Case:	<i>Yes</i>
Rain Gauge:	<i>Davis II (tipping bucket type)</i>
Measurement GPS position:	<i>361872,740615</i>
Nearest reflecting elements & distances from microphone:	<i>Property façade &gt;5m 1.2m high wall &gt;5m</i>

**Table 8.19: List of equipment used at H3**

#### **Noise monitoring location H4**

H4 was chosen to represent the dwellings on Gerrard Street and Hospitalfield Gardens. The chosen property has a relatively large amenity area and was comparatively quiet relative to other potential sites, on the day of deployment. **Figure 8.8** shows the noise monitoring position at H4 (Gerrard Street).





Figure 8.8: Satellite image showing detail at Gerrard Street.

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#### Key

Monitoring position ↓ Dwelling associated with the monitoring position 🏠

The background noise environment had a noticeably different character than at the other monitoring positions. This may be due to its proximity to the more easterly portion of the Elliot Estate and the industrial processes active there. H4 is also nearer the coastline and Arbroath town centre than the other monitoring locations, but it also appeared to be the quietest. The amenity area is very sheltered being bordered by shrubs and small trees.

Figure 8.9 shows the monitoring position at H4 in relation to the property façade and sheltering vegetation to the south.



Figure 8.9: Noise monitoring position at H4.

Details of the monitoring equipment used at H4 are listed in Table 8.20

Equipment List	
Sound Level Meter (IEC 61672-1 Class 1):	Rion NL-31 - Serial No. 00603864
Microphone:	Rion UC-53A - Serial No. 316984
Pre-amp:	Rion NH-21 - Serial No. 32969
Acoustic Calibrator (IEC 60942 Class 1):	Rion NC-74 - Serial No. 34494275
Tripod:	Single integrated pole (1.40m)
Wind Shield:	Double skin Rion WS-03
Environmental Case:	Yes
Measurement GPS position:	362049,740525
Nearest reflecting elements & distances from microphone:	Property façade >5m

**Table 8.20: List of equipment used at H4**

### Noise monitoring

Noise levels were recorded using Rion NL-31 Class 1 integrating sound level meters housed in an environmental case, set to log  $L_{A90,10min}$  and  $L_{Aeq,10min}$  throughout the monitoring period. A double skin wind shield was fitted to the microphone to ensure continued accuracy at higher wind speeds. Acoustic calibration of the device was carried out before, during and after the monitoring period using a Rion NC-74 Acoustic Calibrator. The acoustic calibrator is calibrated every year, while the sound level meter is calibrated by an external body every two years. This ensures IEC 61672 Class 1 compliance.

### Wind speed measurement

Wind speed was measured by a Galion G250-SRI LiDAR unit positioned as near to the proposed turbine location as practical. The turbine location was not suitable due to its proximity to the ~30m tall grain dryers and a row of small trees. It was considered by the LiDAR installation technician that these features had the potential to interfere with the proper functioning of the LiDAR. A suitable location was found in an adjacent storage yard just 50m from the proposed turbine location.

The LiDAR was installed at 361872E,440045N on 15<sup>th</sup> January 2014. Wind speeds used in this noise assessment were derived from a 55m wind speed measurement. **Table 8.21** lists the met-mast instruments and calibration dates. Data was recorded by the Le-Net data-logging system from Logic Energy, accessible via GSM. Measurements were made over a sufficient period for an appropriate range of wind speeds to be recorded.

Sensor	Model	Unit number	Date of last calibration
LiDAR	G250	SR02	10/06/2013
Rain gauge	Davis II	-	-

**Table 8.21: LiDAR instruments and calibration dates**

**Figure 8.10** shows the LiDAR position relative to the Grain Driers near the proposed turbine position.



Figure 8.10: LiDAR position

### 8.3 Data reduction

#### Exclusions – Atypical data

Rainfall has the potential to raise background noise levels; rainfall data was recorded at both H4 and the LiDAR position throughout the monitoring period. The data were compared, compiled and used to flag the presence of rain in the area. For the avoidance of doubt, noise data logged at any of the four monitoring positions during a 10 minute period when rainfall was logged, were excluded automatically. Any 10 minute period preceding or following a period when rain was logged that appears to have been affected by rain, was also excluded.

Time histories of the noise levels recorded at all monitoring positions were interrogated for atypical noise levels that were time dependent or one-off events that appeared not to be associated with the wind conditions. The time histories were also cross-referenced so that the effect of a noise event evident at one monitoring position could be assessed at the others. These atypical data were also removed; all excluded data are shown in the resulting scatter plots for information but are excluded from the regression analysis.

#### Adequate dataset

A minimum of 200 valid data points is required during both amenity hours and night time periods (100 where data has been directly filtered). Sufficient data were recorded for downwind conditions to be filtered and analysed in isolation. Downwind conditions from the perspective of the receptor are defined as winds arriving from the turbine position  $\pm 80^\circ$ , based on evidence from the 'Joule project'<sup>6</sup>; in this case, the receptor is taken as the monitoring position.

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<sup>6</sup> Institute of Acoustics, "A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise", 2013, p22; 4.4.2 / 4.4.3

To establish the applicable noise limits, data were plotted against the concurrent  $v_{10}$  wind speeds measured by LiDAR, and correlations of noise levels to wind speed were established using third or fourth order polynomial functions selected on the basis of 'best fit'; the function and correlation coefficient ( $R^2$ ) values are stated on each chart.

## 8.4 Wind turbine noise prediction

### Propagation model

The International Standard ISO 9613, 'Acoustics – Attenuation of Sound During Propagation Outdoors - Part 2', noise propagation model has been used for the turbine noise calculations.  $L_{Aeq}$  noise propagation was modelled using WindFarm v4.2.1.7 by ReSoft Ltd, which implements the ISO 9613 model.  $L_{A90}$  levels were derived by subtracting two decibels from the  $L_{Aeq}$  values as per the ETSU-R-97 guidance.

The following input parameters are assumed and are consistent with current guidance. Broadband sound power levels are listed for information but have not been used. Octave band calculations were carried out with measured noise levels obtained via the turbine manufacturer assuming atmospheric attenuation coefficients corresponding to 10°C and 70% humidity, a ground attenuation factor of  $G=0.5$  (representing semi-soft ground), and a receptor height of 4m. No barrier correction is applicable to the calculations in this case as at least some portion of the rotor is predicted to be visible from all sensitive dwellings.

### Sound Power Levels

The proposed candidate turbine model is the Enercon E44 with a hub height of 55m. **Table 8.22** shows the measured octave band levels for the candidate turbine model with a hub height of 50m. These levels do not include measurement uncertainty (Q).

L <sub>WA</sub> (dB)	Standardized $v_{10}$ wind speed ( $ms^{-1}$ )			
	7	8	9	10
Octave band				
63Hz	80.7	83.7	84.4	84.2
125Hz	87.5	89.2	90.9	89.9
250Hz	92.5	92.8	93.1	93.3
500Hz	93.5	94.9	96.0	96.3
1000Hz	94.8	96.9	97.5	97.4
2000Hz	92.0	94.2	94.0	94.1
4000Hz	85.3	86.9	86.7	86.8
8000Hz	80.6	80.8	80.4	79.9

**Table 8.22: Measured octave band noise levels as a function of wind speed<sup>7</sup>**

The levels in **Table 8.22** require an upward adjustment due to the 5m increase in hub height. This is calculated to be 0.24 dB and is added to all the above octave band levels.

### Measurement uncertainty

Measurement uncertainty (Q) is stated in the noise report for each wind speed. Total uncertainty is calculated by multiplying Q by a factor of 1.645 and shown in Table 8.23 below:

Standardised 10m wind speed (m/s)	7	8	9	10
Measurement uncertainty (Q) dB(A)	0.75	0.83	0.83	0.86
Total uncertainty (Q x 1.645) dB(A)	1.23	1.37	1.37	1.41

<sup>7</sup> Noise Report: *WICO 042SE207\_pdf*



**Table 8.23: Measurement uncertainty****Warranted Broadband Levels**

**Table 8.24** shows the warranted broadband levels for the candidate turbine model excluding uncertainty.

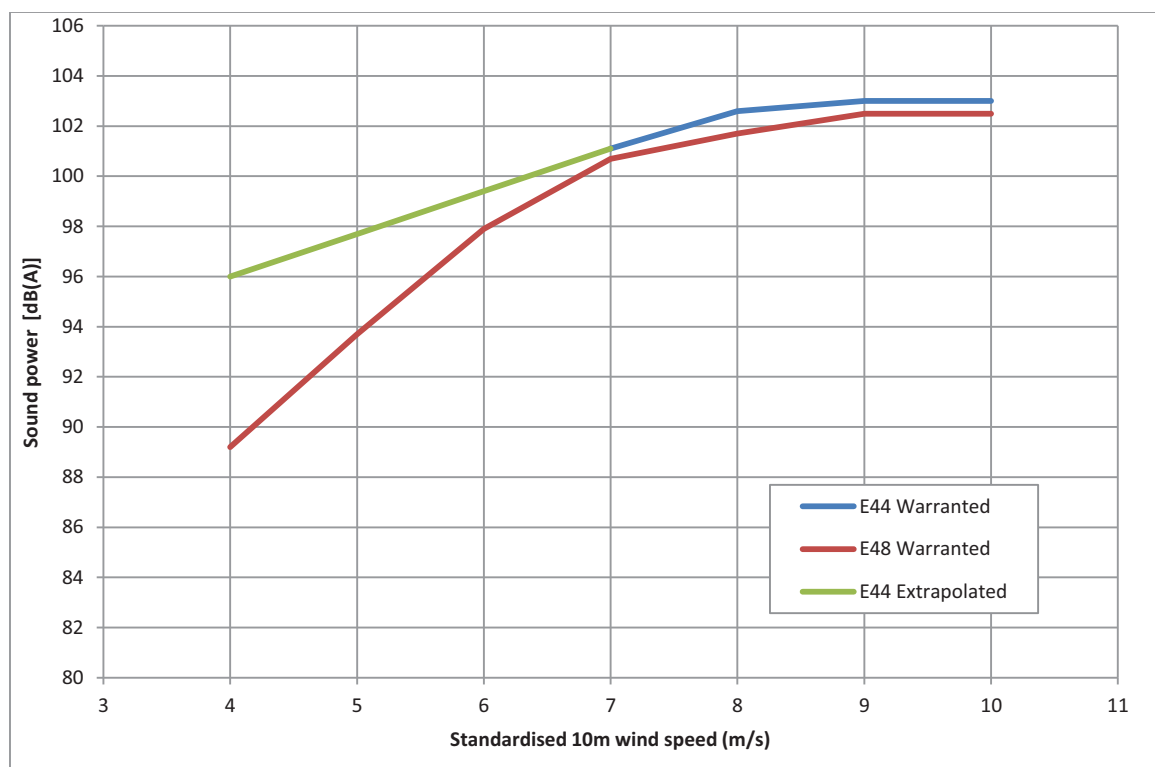
Warranted Broadband Noise levels (55m hub)				
Standardized $v_{10}$ wind speed ( $\text{ms}^{-1}$ )	7	8	9	10
LWA (dB)	101.1	102.6	103.0	103.0

**Table 8.24: Warranted broadband levels as a function of wind speed<sup>8</sup>**

The 900kW E44 reaches rated power before a  $v_{10}$  of  $10\text{ms}^{-1}$  is reached; therefore it is assumed that sound power levels do not increase at higher wind speeds.

*Predicted noise levels at wind speeds below  $7\text{ms}^{-1}$* 

Sound power levels for wind speeds of 4, 5 and  $6\text{ms}^{-1}$  are not available. The mean rate of decrease in the predicted levels at the monitoring positions, from  $8\text{ms}^{-1}$  to  $7\text{ms}^{-1}$  is  $1.7\text{dB(A)}/\text{ms}^{-1}$ . This rate is extrapolated to estimate the sound power for wind speeds of 6, 5 and  $4\text{ms}^{-1}$ . **Figure 8.11** shows warranted broadband levels for the 900kW E44 with the extrapolated sound power levels for the lower wind speeds, alongside the levels for an 800kW E48 turbine; the closest relative in the range of Enercon turbine models.

**Figure 8.11: Extrapolated sound power with reference to the 55m, E48 – 800kW**

The chart shows that the extrapolated rate of decrease is conservative in comparison to an E48 model turbine with the same 55m hub height.

<sup>8</sup> Noise Report: SA-04-SPL Guarantee E-44-Rev1\_2-ger-eng.pdf

### Atmospheric attenuation

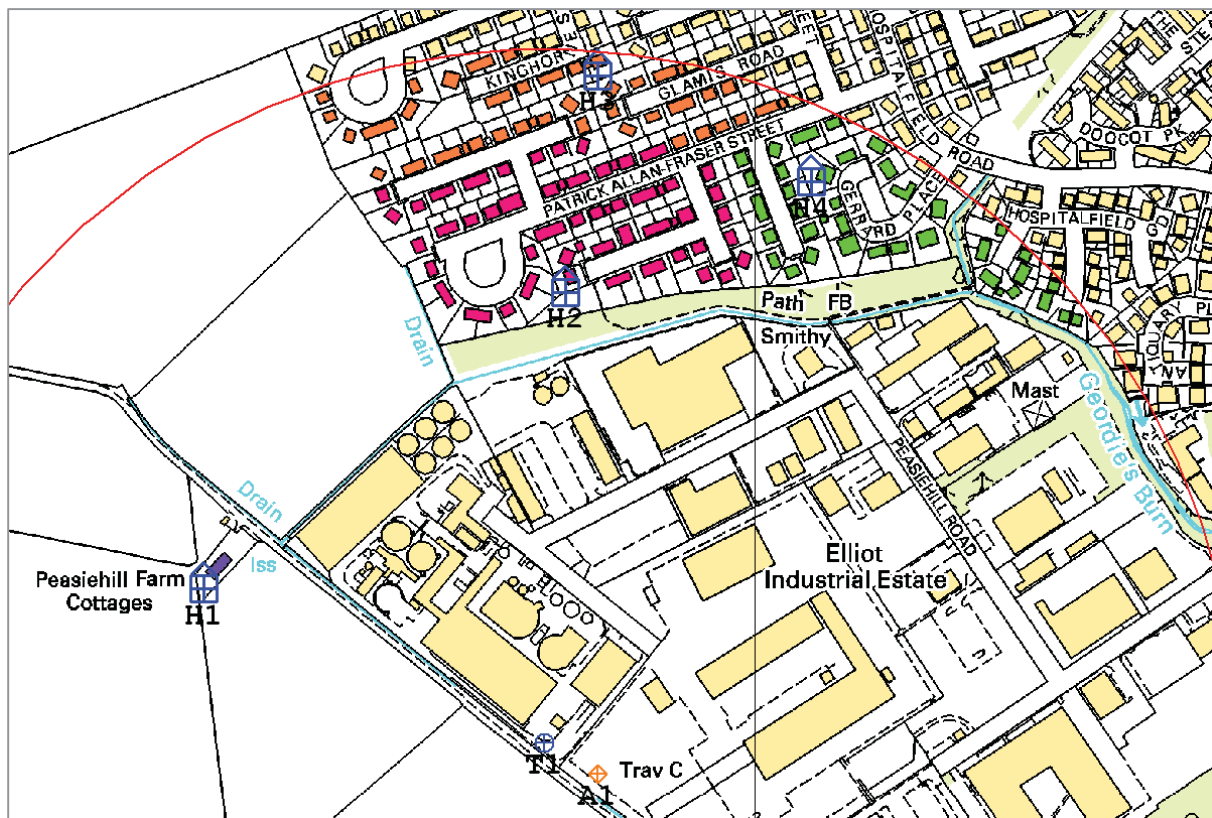
The attenuation of noise as it travels through the air varies with frequency. The atmospheric attenuation coefficients are tabulated below in **Table 8.25**:

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation Coefficient	0.0001	0.0004	0.0010	0.0019	0.0037	0.0097	0.0328	0.1170

**Table 8.25: Attenuation coefficients used for the noise propagation model**

### Modelled distances

The following figure indicates the properties that H1, H2, H3 and H4 are representative of:



- H1 – Peasiehill Cottages – purple properties
- H2 – Patrick Allan Fraser Street – red properties
- H3 – Kinghorne Street – orange properties
- H4 – Gerrard Street – green properties
- T1 – Proposed turbine position
- A1 – LiDAR position

'Line of sight' distances have been assumed, shown to the nearest 10m. The Cottages at Peasiehill are equidistant from the proposed turbine. Properties H2, H3 and H4 are representative of properties that have a range of distances from the proposed turbine. Those ranges are stated in **Table 8.26**:

House ID	Name	Min distance	Actual distance	Max distance
H1	Peasiehill Cottages	310	310	310
H2	Patrick Allan Fraser Street	340	370	510
H3	Kinghorne Street	480	550	570
H4	Gerrard Street	460	510	570

**Table 8.26: Distance of sensitive properties to the nearest turbine**

The ranges of distances from the turbine imply a corresponding range of turbine noise levels. This range of levels is represented in the following charts by the 'max' and 'min' values.

### Predicted wind turbine noise levels

**Table 8.27** shows the predicted turbine  $L_{A90,10min}$  noise levels calculated using the previously defined octave band sound power levels, inclusive of uncertainty. Noise levels are tabulated with reference to  $v_{10}$  wind speeds of  $4ms^{-1}$  to  $12ms^{-1}$ .

Representative Properties			Standardised 10m wind speeds								
House ID	Easting	Northing	4	5	6	7	8	9	10	11	12
H1	361548	740197	33.4	35.1	36.8	38.5	40.2	41.1	41.1	41.1	41.1
Max	361761	740406	32.4	34.1	35.8	37.5	39.2	40.0	40.1	40.1	40.1
H2	361845	740441	31.7	33.4	35.1	36.8	38.4	39.3	39.3	39.3	39.3
Min	361923	740568	28.6	30.3	32.0	33.7	35.3	36.2	36.2	36.2	36.2
Max	361680	740525	29.2	30.9	32.6	34.3	35.9	36.8	36.8	36.8	36.8
H3	361872	740620	27.7	29.4	31.1	32.8	34.5	35.3	35.3	35.3	35.3
Min	361642	740608	27.4	29.1	30.8	32.5	34.1	35.0	35.0	35.0	35.0
Max	362076	740458	29.5	31.2	32.9	34.6	36.3	37.1	37.2	37.2	37.2
H4	362047	740535	28.4	30.1	31.8	33.5	35.2	36.0	36.1	36.1	36.1
Min	362094	740573	27.4	29.1	30.8	32.5	34.1	35.0	35.0	35.0	35.0

**Table 8.27: Predicted wind turbine noise levels ( $L_{A90,10min}$ ) at representative properties.**

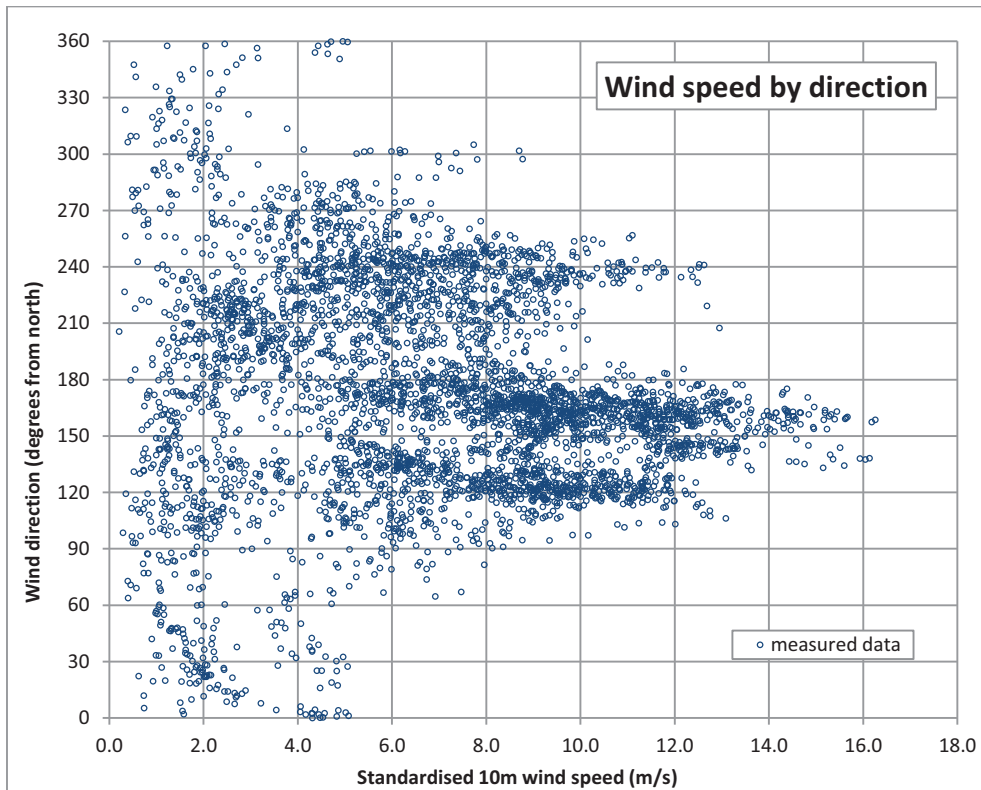
**Table 8.27** shows that the worst case predicted turbine noise levels are for property H1 – Peasiehill Cottages where levels may reach 41.1dB(A) under worst case wind conditions.



## 8.5 Noise impact assessment

### Wind data

Figure 8.12 shows standardised 10m wind speeds logged during the monitoring period. A direction of zero degrees equates to a northerly wind, 90° = E, 180° = S, 270° = W etc.



**Figure 8.12: Variation of Wind Speed with direction measured at 10m height**

The above chart shows that the winds measured during the monitoring period have been predominantly from the south-east through south-west, ideal wind directions for this assessment; both prevailing and downwind conditions are captured for each receptor.

### On-site production activity

**Table 8.28** compares production activity levels to those that are typical for the eight months of the year between early December and the end of July.

Noise source	Normal pattern of operation	During monitoring period
Grain Driers	September to mid-October (harvest season)	Not active
Steep House CO2 extraction fans	Mon 19:00 – Tues 15:00. Tues 21:00-Weds 11:00. Thurs 14:00- Fri 02:00. Fri 06:00-Fri 12:00 Active throughout the year with the exception of September and October.	Normal
Silo 3 cooling fans	3 weeks in total (weather dependant) between end of October and early December.	Not active
Barley Plant blower	All day until between 22:00 & 23:00, 7 days per week	Normal
Steep House conveyor	Monday pm and Wednesday pm for 2 hours when required by Clova. Some occasional additional operation.	Barely used at all
Upper conveyors	Very difficult to quantify, sometimes several hours per day, sometimes not for weeks at a time.	Much less active than typical
Kiln Clova Fans	When kilning: Mon 08:00 – Tues 22:00. Weds 08:00 – Thurs 22:00	Normal
Buhler Tower fans	24 hours per day, 7 days per week	Normal

**Table 8.28: On-site production activity during monitoring period**

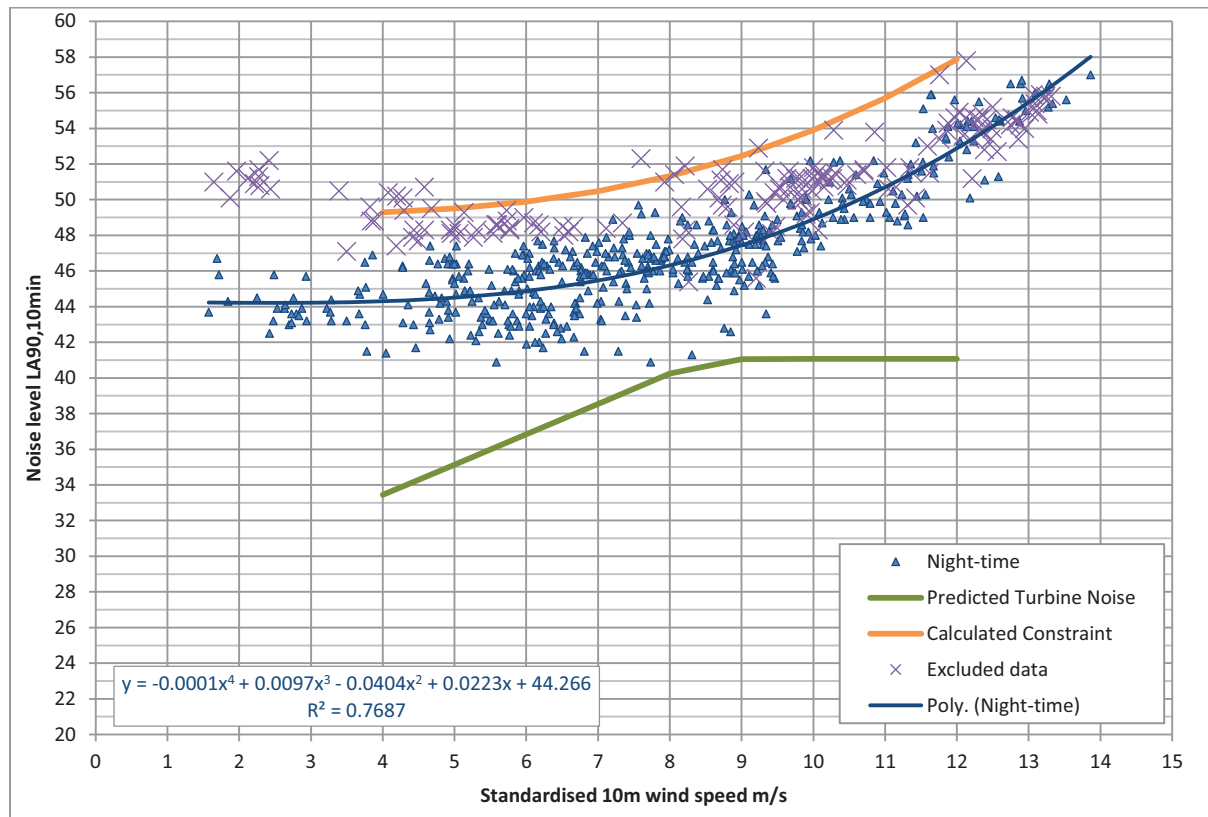
On-site activity was normal for this time of year with the exception of the conveyors which were less active than typical.

### Results

The following figures and associated tables show the measured  $L_{A90,10\text{min}}$  background noise levels and predicted turbine levels as a function of  $v_{10}$  wind speeds. The data are represented by best fit polynomial regression functions from which the noise limits are derived. The figures show the predicted turbine noise levels in relation to the derived limits.

## H1 – Peasiehill Cottage: night-time

Figure 8.13 shows background levels, derived limits and predicted turbine noise levels for H1 during night-time hours.



**Figure 8.13: Background levels, derived limits and predicted turbine noise levels for H1 during night-time.**

Table 8.29 shows the tabulated results for H1 during night time hours.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(416)	16	47	74	62	54	78	32	26	27
Average value L <sub>A90,10min</sub>	dB(A)	44.3	44.5	44.9	45.5	46.3	47.4	48.9	50.7	52.9
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	49.3	49.5	49.9	50.5	51.3	52.4	53.9	55.7	57.9
Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	33.4	35.1	36.8	38.5	40.2	41.1	41.1	41.1	41.1
Level Difference										
Exceedence	dB(A)	-15.9	-14.4	-13.0	-11.9	-11.1	-11.4	-12.8	-14.6	-16.8

**Table 8.29: Background levels, derived limits and predicted turbine noise levels for H1 during night-time.**

Predicted turbine noise remains below all measured background data, suggesting a low likelihood of audibility. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

## H1 – Peasiehill Cottage: quiet daytime

Figure 8.14: shows background levels, derived limits and predicted turbine noise levels for H1 during quiet daytime hours.

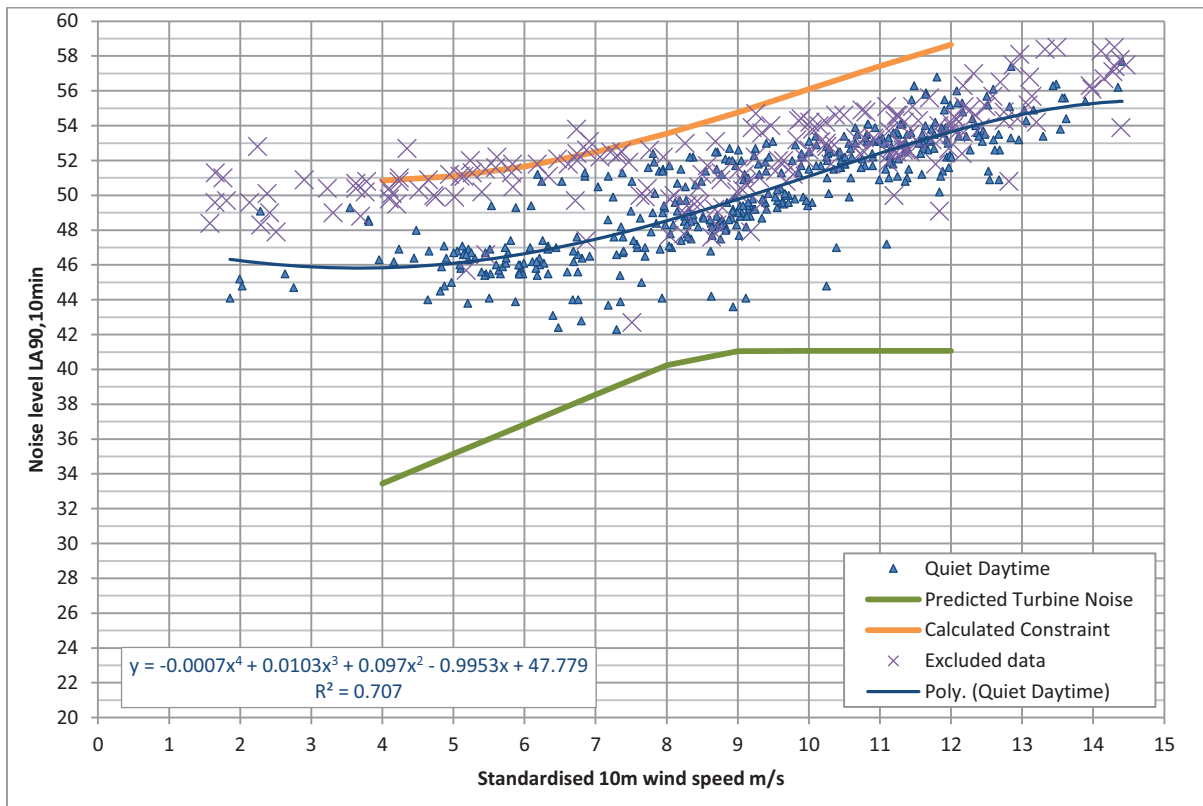


Figure 8.14: Background levels, derived limits and predicted turbine noise levels H1 during quiet daytime hours.

Table 8.30 shows the tabulated results for H1 during quiet daytime hours

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(382)	8	25	41	30	52	72	50	56	48
Average value LA90,10min	dB(A)	45.8	46.1	46.6	47.5	48.5	49.8	51.1	52.4	53.6
Calculated Constraint										
Average value LA90,10min	dB(A)	50.8	51.1	51.6	52.5	53.5	54.8	56.1	57.4	58.6
Predicted Turbine Noise										
Average value LA90,10min	dB(A)	33.4	35.1	36.8	38.5	40.2	41.1	41.1	41.1	41.1
Level Difference										
Exceedence	dB(A)	-17.4	-16.0	-14.8	-13.9	-13.3	-13.7	-15.0	-16.3	-17.6

Table 8.30: Background levels, derived limits and predicted turbine noise levels for H1 during quiet daytime hours.

Predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

H2 – Patrick Allan Fraser Street: night-time

Figure 8.15 shows background levels, derived limits and predicted turbine noise levels for H2 during night-time hours.

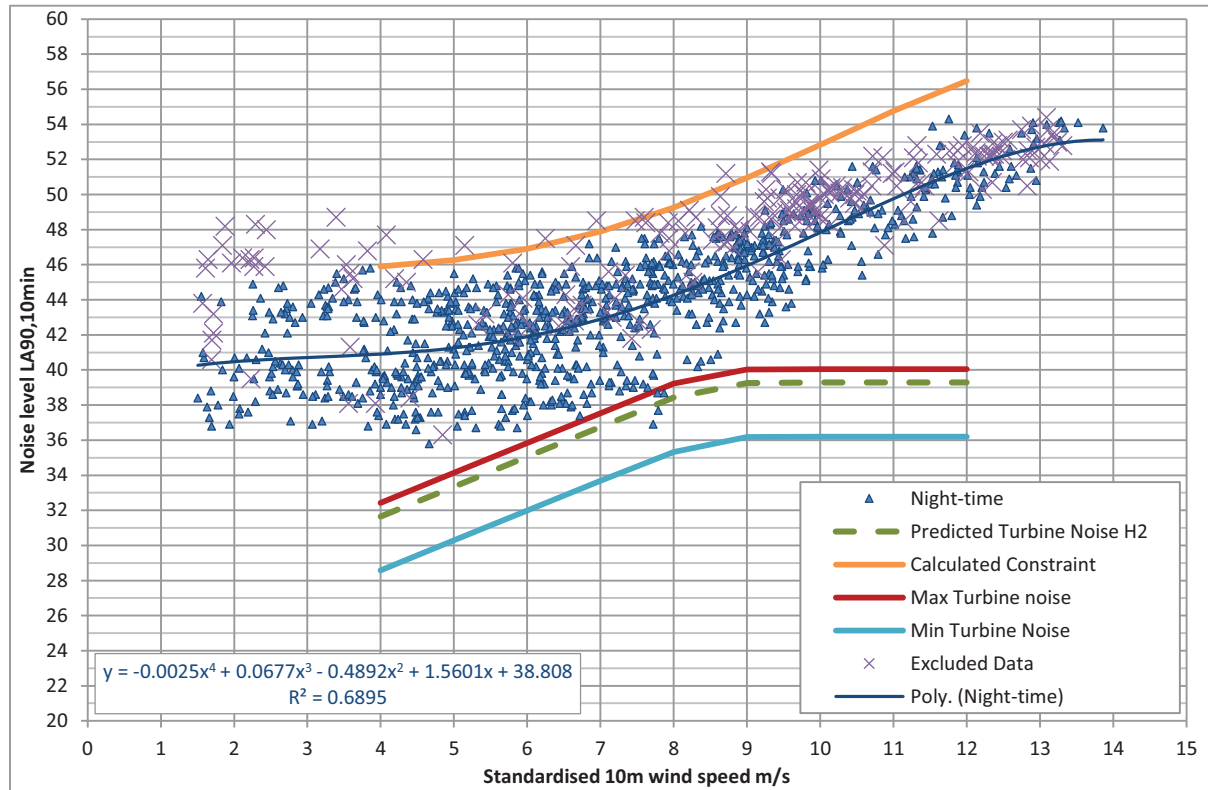


Figure 8.15: Background levels, derived limits and predicted turbine noise levels for H2 during night-time.

Table 8.31 shows the tabulated results for H2 during night-time hours.

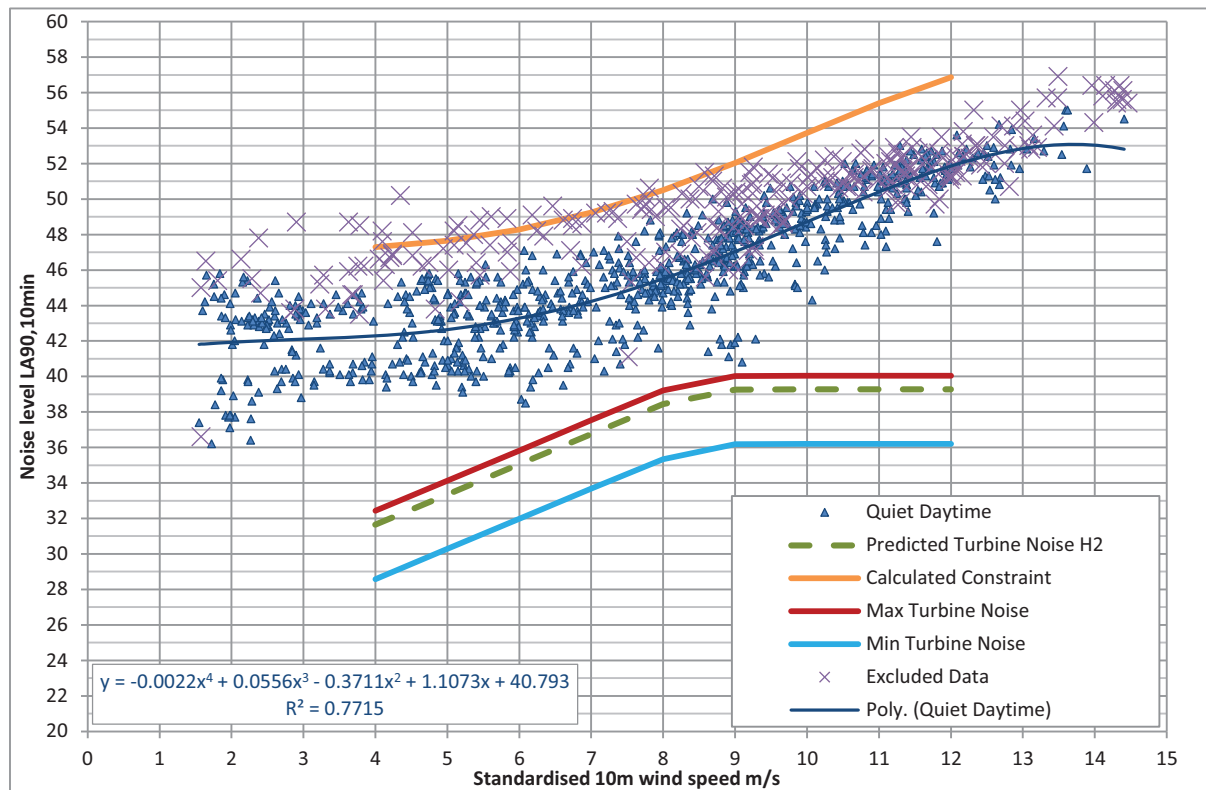
Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(780)	80	102	152	109	102	108	53	37	37
Average value L <sub>A90,10min</sub>	dB(A)	40.9	41.3	41.9	42.9	44.3	45.9	47.8	49.8	51.5
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	45.9	46.3	46.9	47.9	49.3	50.9	52.8	54.8	56.5
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	32.4	34.1	35.8	37.5	39.2	40.0	40.1	40.1	40.1
Level Difference										
Exceedence	dB(A)	-13.5	-12.1	-11.1	-10.4	-10.0	-10.9	-12.8	-14.7	-16.4

Table 8.31: Background levels, derived limits and predicted turbine noise levels for H2 during night-time.

Maximum predicted turbine noise is below measured background data during all but a small number of 10 minute periods. Turbine noise remains 10dB(A) or more below the calculated constraints at all times.

## H2 – Patrick Allan Fraser Street: quiet daytime

Figure 8.16 shows background levels, derived limits and predicted turbine noise levels for H2 during quiet daytime hours.



**Figure 8.16: Background levels, derived limits and predicted turbine noise levels H2 during quiet daytime.**

Table 8.32 shows the tabulated results for H2 during quiet daytime hours.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(710)	41	90	83	64	111	122	81	72	46
Average value L <sub>A90,10min</sub>	dB(A)	42.3	42.6	43.3	44.2	45.5	47.0	48.7	50.4	51.9
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	47.3	47.6	48.3	49.2	50.5	52.0	53.7	55.4	56.9
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	32.4	34.1	35.8	37.5	39.2	40.0	40.1	40.1	40.1
Level Difference										
Exceedence	dB(A)	-14.9	-13.5	-12.4	-11.7	-11.3	-12.0	-13.7	-15.3	-16.8

**Table 8.32: Background levels, derived limits and predicted turbine noise levels for H2 during quiet daytime.**

Maximum predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

H3 – Kinghorn Street: night-time

Figure 8.17 shows background levels, derived limits and predicted turbine noise levels for H3 during night-time hours.

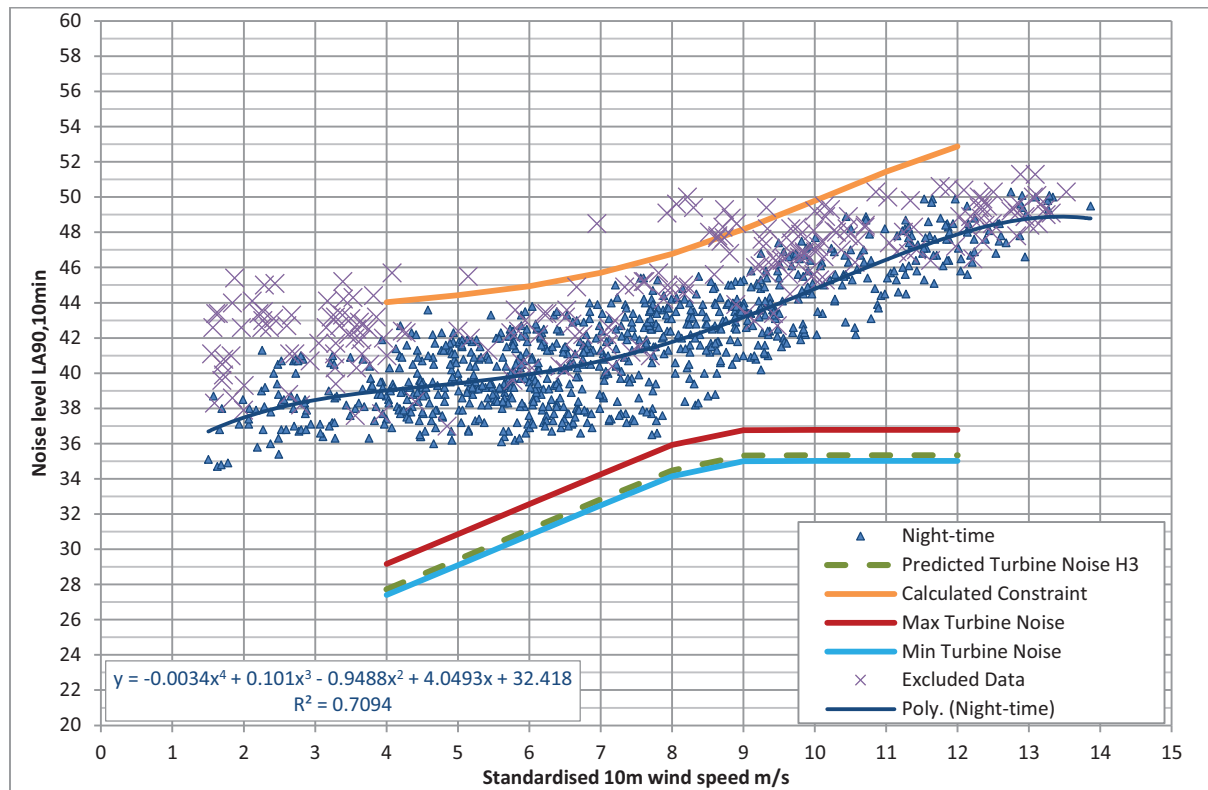


Figure 8.17: Background levels, derived limits and predicted turbine noise levels for H3 during night-time.

Table 8.33 shows the tabulated results or H3 during night time hours.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(779)	71	102	148	104	103	109	58	43	41
Average value L <sub>A90,10min</sub>	dB(A)	39.0	39.4	39.9	40.7	41.8	43.2	44.8	46.4	47.9
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	44.0	44.4	44.9	45.7	46.8	48.2	49.8	51.4	52.9
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	29.2	30.9	32.6	34.3	35.9	36.8	36.8	36.8	36.8
Level Difference										
Exceedence	dB(A)	-14.9	-13.6	-12.4	-11.4	-10.9	-11.4	-13.0	-14.7	-16.1

Table 8.33: Background levels, derived limits and predicted turbine noise levels for H3 during night-time.

Maximum predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.



H3 – Kinghorn Street: quiet daytime

Figure 8.18 shows background levels, derived limits and predicted turbine noise levels for H3 during quiet daytime hours.

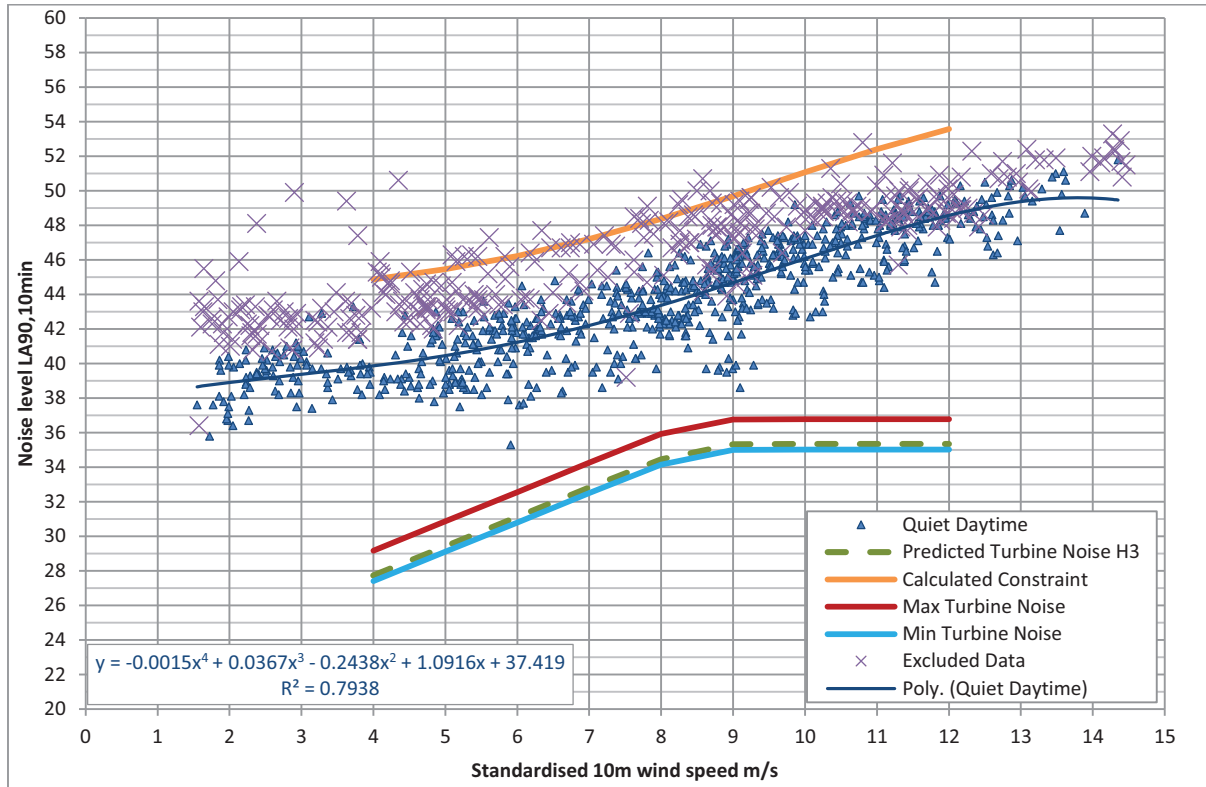


Figure 8.18: Background levels, derived limits and predicted turbine noise levels H3 during quiet daytime.

Table 8.34 shows the tabulated results for H3 during quiet daytime hours

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(665)	33	68	73	62	104	120	85	72	48
Average value L <sub>A90,10min</sub>	dB(A)	39.9	40.5	41.2	42.2	43.4	44.7	46.1	47.4	48.6
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	44.9	45.5	46.2	47.2	48.4	49.7	51.1	52.4	53.6
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	29.2	30.9	32.6	34.3	35.9	36.8	36.8	36.8	36.8
Level Difference										
Exceedence	dB(A)	-15.7	-14.6	-13.7	-12.9	-12.4	-12.9	-14.3	-15.6	-16.8

Table 8.34: Background levels, derived limits and predicted turbine noise levels for H3 during quiet daytime.

Maximum predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

H4 – Gerrard Street: night-time

Figure 8.19 shows background levels, derived limits and predicted turbine noise levels for H4 during night-time hours.

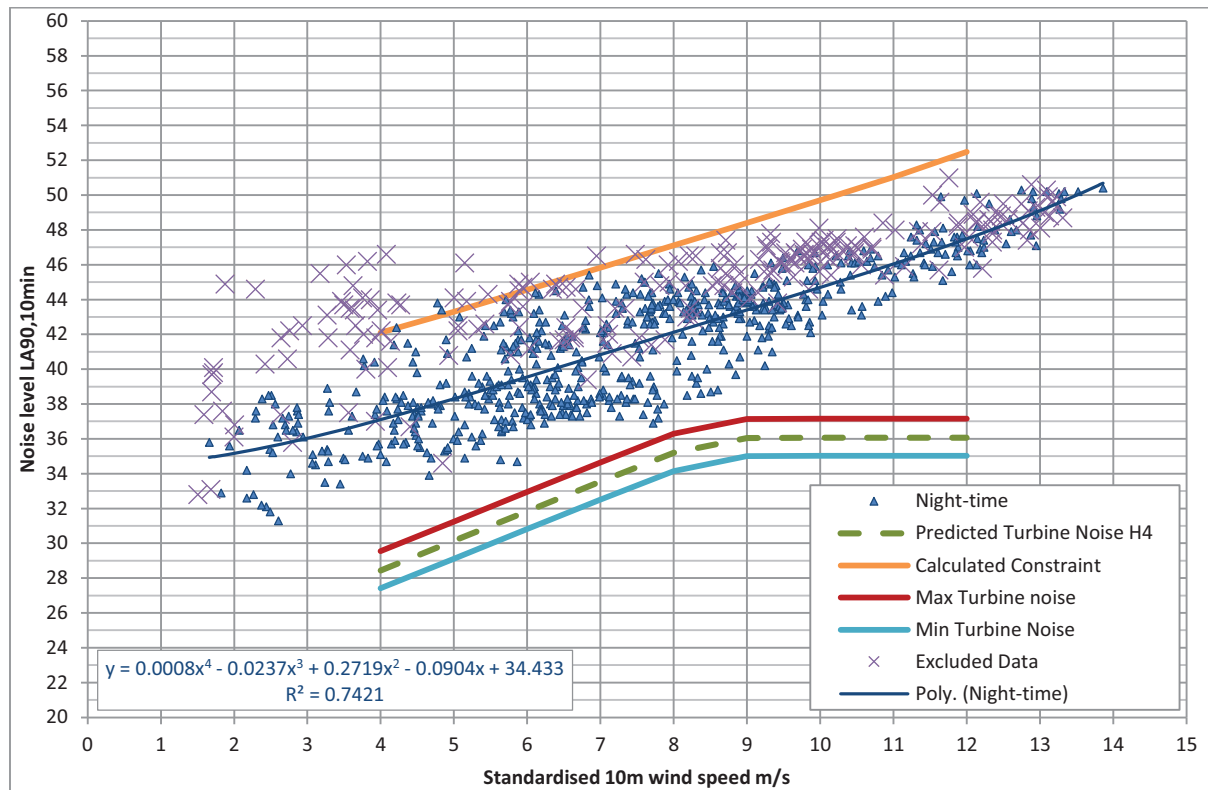


Figure 8.19: Background levels, derived limits and predicted turbine noise levels for H4 during night-time.

Table 8.35 shows the tabulated results for H4 during night-time hours.

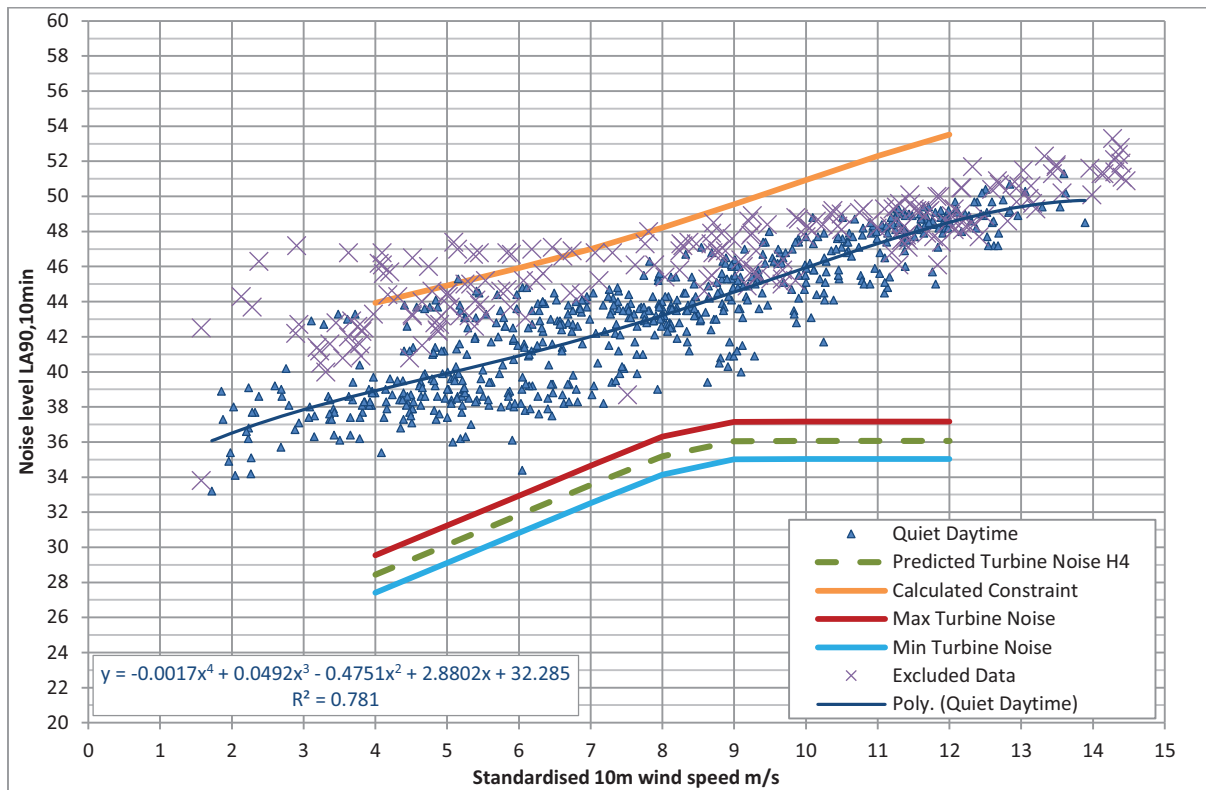
Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(574)	44	59	114	78	87	93	37	30	32
Average value L <sub>A90,10min</sub>	dB(A)	37.1	38.3	39.5	40.8	42.1	43.4	44.7	46.0	47.5
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	42.1	43.3	44.5	45.8	47.1	48.4	49.7	51.0	52.5
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	29.5	31.2	32.9	34.6	36.3	37.1	37.2	37.2	37.2
Level Difference										
Exceedence	dB(A)	-12.6	-12.1	-11.6	-11.2	-10.8	-11.3	-12.5	-13.9	-15.3

Table 8.35: Background levels, derived limits and predicted turbine noise levels for H4 during night-time.

Maximum predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

## H4 – Gerrard Street: quiet daytime

Figure 8.20 shows background levels, derived limits and predicted turbine noise levels for H4 during quiet daytime hours.



**Figure 8.20: Background levels, derived limits and predicted turbine noise levels H4 during quiet daytime.**

Table 8.36 shows the tabulated results for H4 during quiet daytime hours.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(564)	47	76	73	63	83	69	51	56	46
Average value L <sub>A90,10min</sub>	dB(A)	38.9	39.9	40.9	42.0	43.2	44.5	45.9	47.3	48.5
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	43.9	44.9	45.9	47.0	48.2	49.5	50.9	52.3	53.5
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	29.5	31.2	32.9	34.6	36.3	37.1	37.2	37.2	37.2
Level Difference										
Exceedence	dB(A)	-14.4	-13.7	-13.0	-12.4	-11.9	-12.4	-13.8	-15.1	-16.4

**Table 8.36: Background levels, derived limits and predicted turbine noise levels for H4 during quiet daytime.**

Maximum predicted turbine noise remains below all measured background data. Turbine noise remains more than 10dB(A) below the calculated constraints at all times.

## 8.6 Discussion

### Review of measured background levels

The monitoring positions were within ~500m of each other. As a cross-reference, all night-time levels, followed by the corresponding quiet daytime levels, are plotted on the two charts that follow; Figure 8.21 shows the background levels measured during night-time periods.

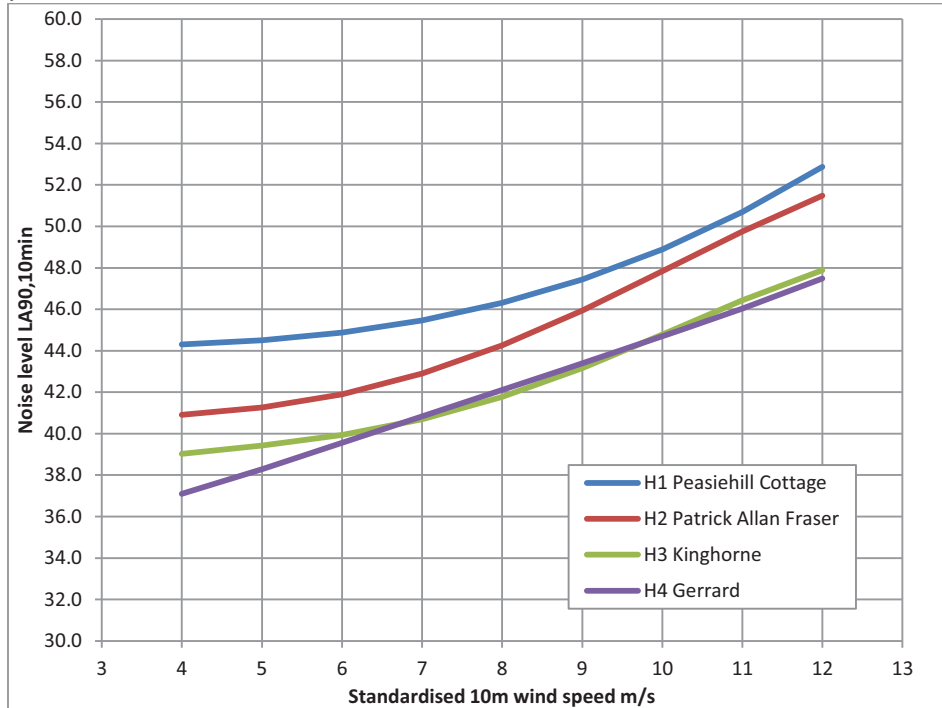


Figure 8.21: Measured night-time background levels

Figure 8.22 shows measured levels during quiet daytime hours

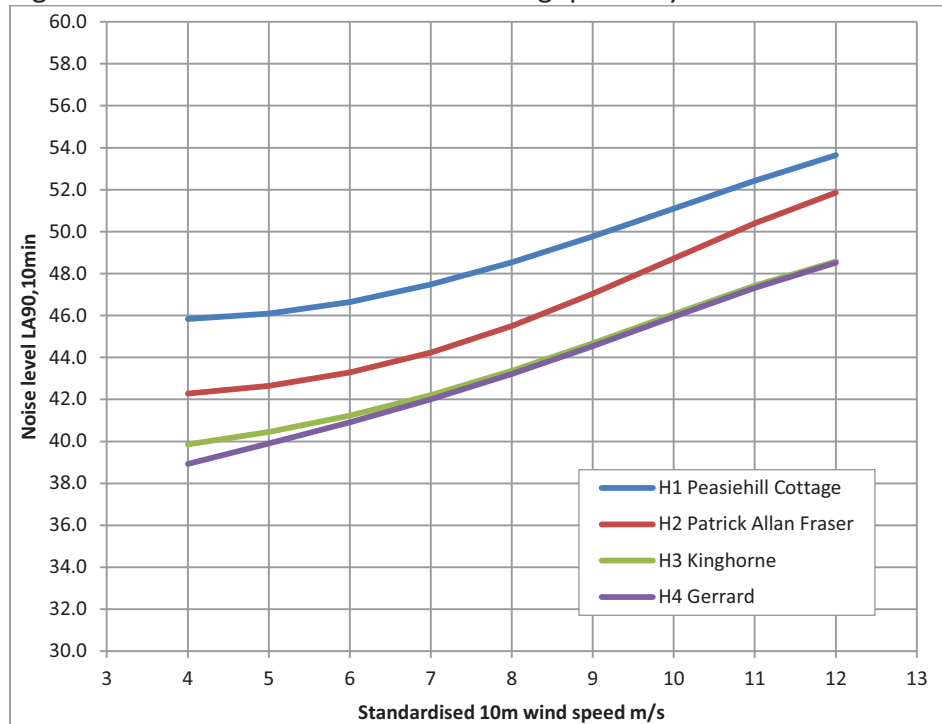


Figure 8.22: Measured quiet daytime background levels

Being an urban location, the measured levels appear high in comparison with the rural levels more typical of an ETSU-R-97 assessment. However, the record of operations at Bairds Malt indicate that the level of activity during the monitoring period was representative of a baseline level of activity, typical for the majority of the annual production cycle, and no unusual noise events were recorded by any of the four residents who consented to having noise monitoring equipment at their property<sup>9</sup>.

The plots show that there is a good deal of coherence, both between the two measurement periods, and the four measurement locations. H2 shows the steepest noise slope above  $9\text{ms}^{-1}$ , possibly due to having more trees within 100m than other locations; none were in leaf during the monitoring period. Upwards of  $7\text{ms}^{-1}$ , H3 and H4 show very close agreement giving a positive indication that the noise environment of the quieter locations (represented by these two monitoring positions) does not vary significantly; Gerrard Street appears the quieter of the two at the lower wind speeds.

Of the data shown, wind driven noise is at a minimum during 10m wind speeds of  $4\text{ms}^{-1}$ . At this wind speed, the two closest locations to Bairds show a similar  $\sim 1.5\text{dB}$  reduction in level between quiet daytime and night-time periods suggesting that Bairds is the dominant noise source under these conditions and is more active during quiet daytime hours than at night. If Bairds (resolved to a point source at approximately 361720E,740210N) were the most significant noise source across all monitoring positions, a 6dB reduction would be expected for every doubling of distance.

<sup>9</sup> Example Noise Diary shown at appendix 2

This is approximately the case for the 50% increase in distance between H1 and H2 from this nominal point, at  $4\text{ms}^{-1}$  during quiet daytime periods. The rate of decrease between H2 and H3 is  $\sim 3.5\text{dB}$ , and between H2 and H4  $\sim 4.5\text{dB}$ , per doubling of distance, under these conditions. This implies that other significance noise sources are contributing to the noise environment at the more distant locations; H3 and H4.

#### Tabulated exceedence for all properties during night-time hours

Exceedence (dB) is shown in **Table 8.37**.

Representative Properties		Standardised 10m Wind Speeds								
House ID	Name	4	5	6	7	8	9	10	11	12
H1	Peasiehill Cottage	-15.9	-14.4	-13.0	-11.9	-11.1	-11.4	-12.8	-14.6	-16.8
H2 (max)	Patrick Allan Fraser	-13.5	-12.1	-11.1	-10.4	-10.0	-10.9	-12.8	-14.7	-16.4
H3 (max)	Kinghorne	-14.9	-13.6	-12.4	-11.4	-10.9	-11.4	-13.0	-14.7	-16.1
H4 (max)	Gerrard	-12.6	-12.1	-11.6	-11.2	-10.8	-11.3	-12.5	-13.9	-15.3

**Table 8.37: Tabulated exceedence (dB) for all properties during night-time**

#### Tabulated exceedence for all properties during quiet daytime hours

Exceedence (dB) is shown in **Table 8.38**.

Representative Properties		Standardised 10m Wind Speeds								
House ID	Name	4	5	6	7	8	9	10	11	12
H1	Peasiehill Cottage	-17.4	-16.0	-14.8	-13.9	-13.3	-13.7	-15.0	-16.3	-17.6
H2 (max)	Patrick Allan Fraser	-14.9	-13.5	-12.4	-11.7	-11.3	-12.0	-13.7	-15.3	-16.8
H3 (max)	Kinghorne	-15.7	-14.6	-13.7	-12.9	-12.4	-12.9	-14.3	-15.6	-16.8
H4 (max)	Gerrard	-14.4	-13.7	-13.0	-12.4	-11.9	-12.4	-13.8	-15.1	-16.4

**Table 8.38: Tabulated exceedence (dB) for all properties during quiet daytime**

The tabulated values show a maximum exceedence of  $-10.0\text{dB}$  at H2 during night-time hours. The most sensitive wind speed in all cases is a  $10\text{m}$  wind speed of  $8\text{ms}^{-1}$  and where a similar level of impact is shown.

## 8.7 Conclusions

### Assessment of noise impact

It has been demonstrated that the project would comfortably meet ETSU-R-97 guidance derived noise constraints at the nearest properties in the absence of any mitigating factors. The information collated here strongly suggests that the proposed turbine would have a low level of noise impact in the context of the noise environment characterised at this location. It is noteworthy that, with very limited exceptions, even the worst case predicted turbine levels (H1) would remain below the quietest of the prevailing background levels measured (H4).

It is expected that the proposed wind project would rarely be audible, and could therefore be accommodated in this area in noise terms without unacceptable impact on surrounding properties.

### Mitigation

The project is predicted to comfortably meet the background related constraints, therefore no mitigation is proposed.

### Summary

Using worst case assumptions, noise constraints have been derived for the closest properties to the proposed wind turbines, based on the variation of background noise with wind speed. It is expected that these constraints would be comfortably met during both night-time and daytime amenity hours.

### Noise conditions

It is recommended that, if the project is to go ahead, suitable planning conditions are formulated based on the background noise constraints found referenced to  $v_{10}$  wind speeds.



## 9 Cultural Heritage/Archaeology

### 9.1 Introduction

Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. Cultural heritage and archaeology features can include features such as buildings, earthwork monuments and artefact scatters as well as sub-surface archaeological remains and landscape features such as field boundaries and industrial remains.

The aim of this study is to identify elements of archaeological and cultural heritage value that may be impacted upon by the proposed wind turbine at Bairds Malt.

### 9.2 Guidance

Statutory, general, national and local guidance for assessing the potential impact of wind turbines on cultural heritage features is given in:

- SPP – Historic Environment
- Scottish Historic Environment Policy (SHEP) 2011
- Managing Change in the Historic Environment guidance note series –Setting
- PAN 2/2011 – Planning and Archaeology

### 9.3 Methodology

This study assesses both the direct and indirect impacts of the proposed development. This section sets out the assessment methodology and how the significance of these impacts has been derived.

#### Data Sources

In the preparation of this assessment, a range of historical and technical data was collected and analysed. The following sources were consulted:

- Historic Environment Record (HER);
- National Monuments Record Scotland (NMRS);
- Aerial photograph collection held by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS);
- National Library of Scotland (Map Library); and
- Historic Scotland's database of; Listed Buildings, Scheduled Monuments (SMs), Gardens and Designed Landscapes (GDLs), Conservation Areas, Inventory Battlefields, World Heritage Sites and monuments proposed for scheduling.

A phased approach to the assessment was adopted:

**Direct Impact**

The area most at risk of direct impact was assessed to be land 50m either side of the access track and within 200m of the proposed wind turbine location (**Figure 9.1**).

**Indirect Impact**

The indirect visual impact on the setting, character and historical integrity of known cultural heritage sites has been considered within this assessment.

Nationally significant features such as Scheduled Monuments, Gardens and Designed Landscapes, 'A' Listed Buildings, Inventory Battlefields and World Heritage Sites were considered within 5km of the proposed wind turbine.

Regionally significant features such as 'B' listed buildings, and conservation areas were considered out to 2km of the proposed turbine (**Figure 9.2**).

Other local or nationally important features identified by either Historic Scotland (HS) or the Council's archaeologist during the consultation process have also been included in the assessment.

It is acknowledged that woodland and vegetation that could potentially restrict views of a development is subject to change. External factors such as felling, disease and wind damage are out with the applicant's control. The setting of each historic feature has been assessed as per the current situation, but it is recognised that screening provided by vegetation and woodland is potentially subject to change.

**Cultural Heritage/Archaeology Figures and Visual Aids**

The assessment has made use of the following:

- Zone of Theoretical Visibility (ZTV) maps which identify which areas the turbine is theoretically visible from. This is a 'bare earth' representation which does not take into account local screening from vegetation or buildings;
- Wirelines produced using the ReSoft Windfarm programme; and
- Photomontages (where requested by Historic Scotland or the Council's Archaeologist).

**Historic Maps**

Historic maps held at the National Library of Scotland (Map Library) and aerial photographs were consulted as part of the desk based assessment.

**Table 9.1 - Historic maps of the proposed wind turbine location**

Map	Date	Notable Historic Changes
Roy Highlands	1747-1752	Area is not depicted on the map.
OS Six Inch	1843-1882	Hospitalfield is depicted on the map.
OS One Inch - Outline	1855-1900	No changes discernible.
OS One Inch - Hills	1855-1903	No changes discernible.
OS Six Inch	1892-1905	Hospitalfield grounds are bordered by mature woodlands.
Bartholomew Half Inch	1897-1907	No changes discernible.
Bartholomew Survey Atlas	1912	No changes discernible.
OS Quarter Inch	1921-1923	No changes discernible.
Bartholomew Half-Inch	1926-1935	No changes discernible.
OS 1: 25, 000	1937-1961	Hospitalfield now labelled as 'Art College', Geordies Burn is depicted on the map.
Air Photos	1944-1950	Village of Hospitalfield is shown.
OS One Inch	1945-1948	No changes discernible.
OS One Inch	1955-1961	No changes discernible.

### Information Gaps

An attempt has been made to consult all readily available documentary sources. However, it is possible that there may be other documentary sources held by RCAHMS and the National Archives of Scotland, which have not been consulted as part of this assessment.

### Assessment Criteria

The following general criteria outlined in **Tables 9.2** and **9.3** have been used, as guided by Historic Scotland, in the assessment of significance of any direct or indirect impact on any site of cultural heritage importance.

**Table 9.2 – Sensitivity of cultural heritage and archaeological features**

Sensitivity	Definition
High	Category A listed buildings Scheduled Monuments Gardens and Designed Landscapes World Heritage Sites Inventory Battlefields Non-statutory List of sites likely to be of national importance
Medium	Category B listed buildings Category C listed buildings Archaeological sites on the Sites and Monuments Record (of regional and local importance) Conservation Areas
Low	Archaeological sites of lesser importance Non-Inventory Gardens and Designed Landscapes

**Table 9.3 - Magnitude of cultural heritage and archaeological effects**

Magnitude	Definition
High	<p>Any number of wind turbines and/or ancillary development that would result in:</p> <ul style="list-style-type: none"> <li>• the removal or partial removal of key features, areas or evidence important to the historic character and integrity of the site, which could result in the substantial loss of physical integrity; and/or</li> <li>• a substantial obstruction of existing view by the addition of uncharacteristic elements dominating the view, significantly altering the quality of the setting or the visual amenity of the site both to and from.</li> </ul>
Medium	<p>Any number of wind turbines and/or ancillary development that would result in:</p> <ul style="list-style-type: none"> <li>• the removal of one or more key features, parts of the designated site, or evidence at the secondary or peripheral level, but are not features fundamental to its historic character and integrity; and/or</li> <li>• a partial obstruction of existing view by the addition of uncharacteristic elements which, although not affecting the key visual and physical relationships, could be an important feature in the views, and significantly alter the quality of the setting or visual amenity of the site both to and from.</li> </ul>
Low	<p>Any number of wind turbines or ancillary developments that may result in:</p> <ul style="list-style-type: none"> <li>• a partial removal/minor loss, and/or alteration to one or more peripheral and/or secondary elements/features, but not significantly affecting the historic integrity of the site or affect the key features of the site; and/or</li> <li>• an introduction of elements that could be intrusive in views, and could alter to a small degree the quality of the setting or visual amenity of the site both to and from.</li> </ul>
Negligible	<p>Any number of wind turbines or ancillary developments that may result in:</p> <ul style="list-style-type: none"> <li>• a relatively small removal, and/or alteration to small, peripheral and/or unimportant elements/features, but not affect the historic integrity of the site or the quality of the surviving evidence; and/or</li> <li>• an introduction of elements that could be visible but not intrusive in views, and the overall quality of the setting or visual amenity of the site would not be affected both to and from.</li> </ul>

The overall significance of effect on each feature is determined by the combination of sensitivity and the predicted magnitude of change. This is presented in **Table 9.4**.

Table 9.4 – Significance of effect matrix

Sensitivity	Magnitude of Change			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible

### Development Operation and Decommissioning

After the 25 year life span of the development, the project will be de-commissioned and the surrounding landscape will be returned to its original state.

### 9.4 Consultation

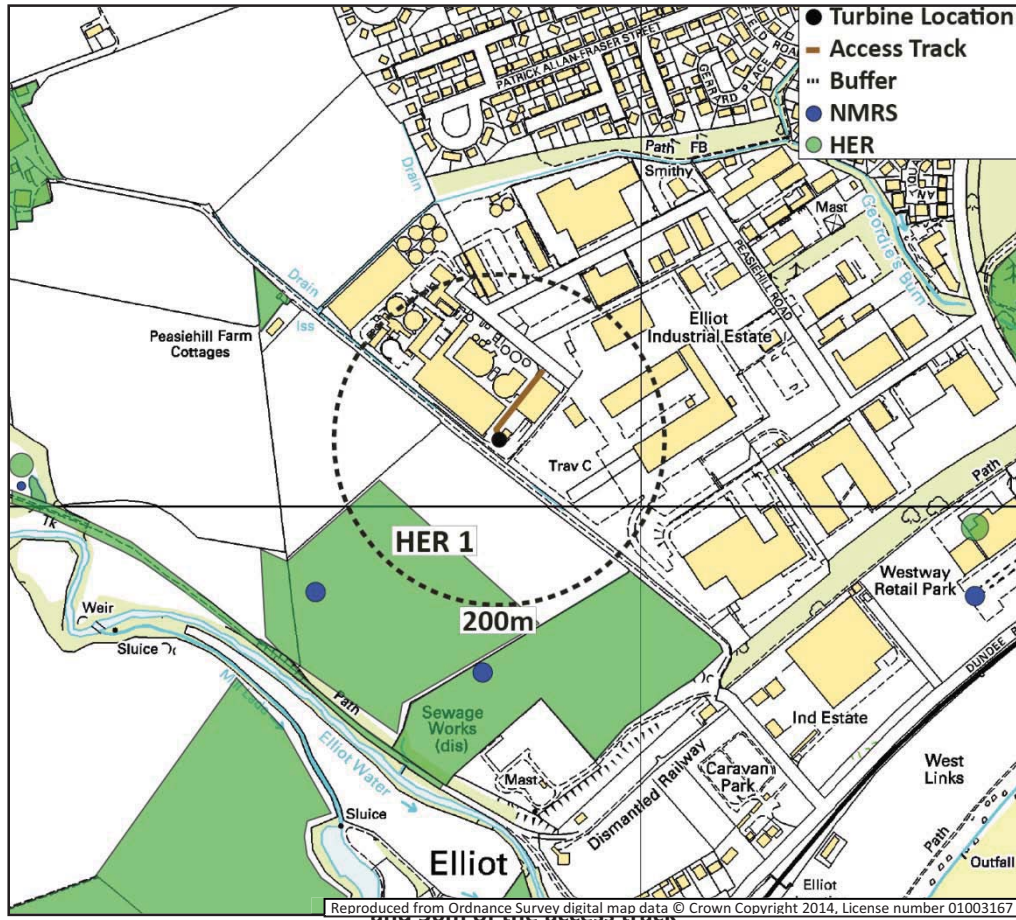
Angus Council and Historic Scotland were consulted as part of an informal scoping exercise in May 2013.

Historic Scotland's consultation response stated that, *"On the basis of the information supplied so far, we can indicate at this stage that we have no objection in principle to a wind turbine development in this location, but would expect certain aspects of the proposals to be assessed"*.

Historic Scotland requested the production of photomontages from Hospitalfield (HB No. 21253), which is a nearby 'A' listed building, to support the assessment. The response stated that a photomontage from *"the tower or a principle room on the W and a viewpoint showing Hospitalfield with the proposed turbine behind and in line with the A listed building would be very useful."* These have been produced as part of this assessment, and are included as **Appendix 4**.

9.5 Baseline

Direct Impacts



As shown in **Figure 9.1**, there is one feature of historical significance within the 200m buffer. A brief description of the feature is given in **Table 9.5** below.

Table 9.5 - Cultural Heritage within 200m

NMRs/ HER number	Site number	Distance	Name	Description
HER 1	NO63NW12	~160m	Peasiehill	Cropmarks, of a ring-ditch, pits and rig and furrow; recorded by aerial photography in 1981 and subsequently by the RCAHMS during aerial reconnaissance in 1981 and 1996.

Peasiehill (HER 1) is within a modern agricultural field ~160m to the south-west of the proposed single turbine location at its closest point.



## Indirect Visual impacts

### 2km Study Radius

The study has found 2 conservation areas, 18 'B' listed buildings, 2 'A' listed buildings and 3 SMs within 2km of the proposed wind turbine. No Inventory Battlefields, World Heritage Sites or GDLs were found to fall within this radius.

### 5km Study Radius

Within 5km of the project an additional 8 'A' listed buildings, 18 SMs and a GDL were identified. No World Heritage Sites or Inventory Battlefields are located within 5km of the proposed turbine. The locations of the historic features are shown in **Figure 9.2**. A larger version of this map, along with a brief description and comment on the setting of each feature, can be found in **Appendix 4**.

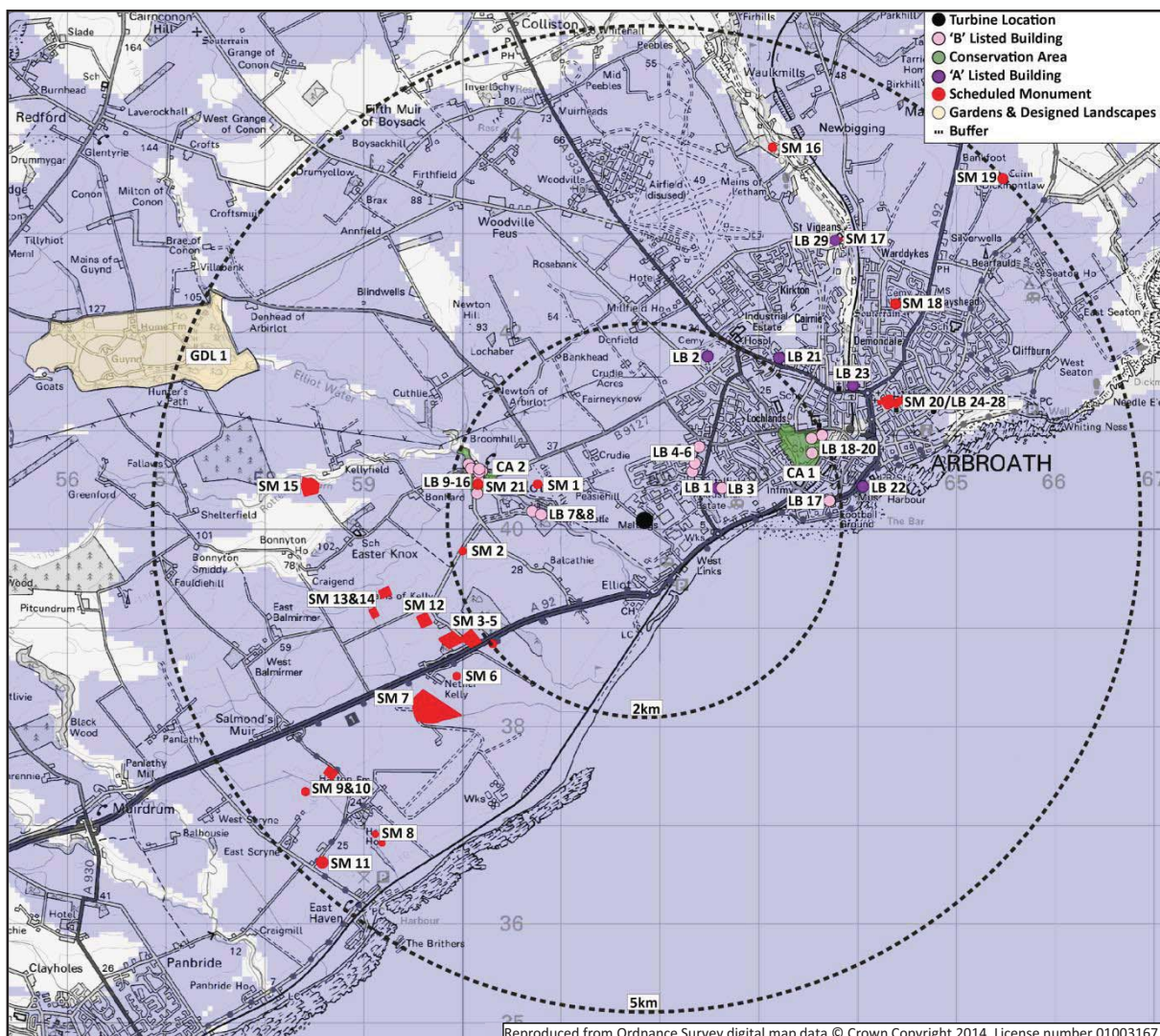


Figure 9.2 – Features of historical significance within 5km, showing area of theoretical visibility.



## 9.6 Evaluation of Effects

### Direct Effects

One feature was found within the direct impact study radius. The impact of the Bairds Malt turbine on this feature is assessed below.

**Table 9.7 - Effects and Evaluation of Significance: Direct Effects**

Effect	Distance	Sensitivity	Magnitude	Significance	Comment
<b>HER 1</b> Peasihill	~160m	Medium	Negligible	Negligible	The feature lies outwith the development's direct impact footprint. No adverse impact is predicted.
Direct effect on presently unrecorded archaeology	Unlikely	Unknown	Unknown	Unknown	The small area of intrusive works is unlikely to have a significant impact on archaeological remains.

### Indirect Effects within 5km

The indirect visual impact of the proposed turbine on each of the identified features is assessed below.

Table 9.8 - Effects and Evaluation of Significance: Indirect Effects Features 5km

Name	Distance	Sensitivity	Magnitude	Impact	Comment
LB 1 Hospitalfield 'A' listed	~0.8km	High	Low	Moderate	<p>The current setting of the baronial mansion is characterised by its location at the end of a tree lined access track and amongst the mature trees that comprise its immediate border. To the rear of the property lie the House's gardens and the urban area of Arbroath, to the north-west the residential area of Hospitalfield and to the south-west an industrial estate. The main façade of the house is oriented to the south-west with views across the industrial estate. There is an industrial estate in the predominant views from the houses main facade, which adds an industrial element to the house's current setting. The telecommunications mast within the industrial estate adds a vertical aspect to the views to the south-west of the house.</p> <p>The proposed single turbine will be located to the south-west of the mansion, and will form part of the industrial estate.</p> <p>As requested by Historic Scotland, <b>CHVP-01</b> was taken from the tower as this view represented the most open view in the direction of the development, and as such represents the worst case scenario. From this elevated position, it is clear that the turbine will add a vertical element in views to the south-west of the house although the existing telecommunications mast is an existing predominant structure in this view. It is not expected that the proposed turbine will detract from the current view in this direction, which also includes the industrial estate, the Westway retail park and the Hospitalfield residential areas.</p> <p><b>CHVP-02</b> shows that from ground level, the tower of the turbine will be visible. The turbine will be located to the left of the existing telecommunications mast, appearing of a similar scale to this structure.</p> <p>Two further viewpoints have been taken in order to represent the potential impact of the development upon the wider setting of the house, as requested by Historic Scotland. <b>CHVP-03</b> was taken from the A92. The view shows that the mature trees, which characterise the immediate setting of the house, partially screen the house from this view. To the left of the view both the telecommunications mast and the turbine are clearly visible. From this viewpoint it is clear that the development does not detract from the current setting of the house. <b>CHVP-04</b> was taken from the road to Arbirlot looking back across the industrial estate towards the house. Although the turbine and telecommunications mast are again visible, the intervening industrial estate and surrounding mature trees screen views of the house from this viewpoint.</p> <p>Although the turbine will add a vertical element to views both to and from the house, the proposed</p>

Name	Distance	Sensitivity	Magnitude	Impact	Comment
					single turbine is not expected to adversely impact upon the house's current setting or the way in which it is understood within the landscape.
<b>LB 2</b> Mortuary Chapel 'A' listed	~1.8km	High	Negligible	Minor/ Negligible	The full extent of the proposed single turbine is expected to be visible in views to the south-south-west of the chapel. The immediate setting of the chapel is within its associated graveyard on the eastern periphery of Arbroath. The intervening townscape of both the east of Arbroath and the urban area of Hospitalfield are expected to prevent long distance views in the direction of the proposed development.
<b>LB 3</b> Hospitalfield Fernery 'B' listed	~0.9km	Medium	Negligible	Minor	The full extent of the proposed single turbine is expected to be visible in views to the south-west of the fernery. The immediate setting of the historic feature is within the grounds of Hospitalfield mansion. The mansion grounds are bordered by mature woodlands that are expected to prevent long distance views both to and from the feature.
<b>LB 4, LB 5 &amp; LB6</b> Hospitalfield Doocot, Farm Building and North Lodge	~0.7km	Medium	Negligible	Minor	Despite theoretical visibility of the development, no views of the turbine can be expected due to the surrounding buildings.
<b>LB 7</b> Kelly Castle 'B' listed	~1.0km	Medium	Low	Moderate/ Minor	The immediate setting of the castle is within mature woodlands. The mature woodlands to the north-east of the castle are expected to prevent ground level long distance views of the single turbine. The turbine is expected to be visible in oblique views from the upper floors to the east. No significant adverse impacts upon the current setting of the castle are predicted.
<b>LB 8</b> Kelly Castle-Doocot 'B' listed	~1.2km	Medium	Low	Moderate/ Minor	The full extent of the proposed single turbine is expected to be visible to the east. The immediate setting of the doocot is within Kelly Castle's mature woodlands. The woodlands that surround the doocot are expected to restrict long distance views in the direction of the proposed development. The current setting of the doocot is not expected to be adversely impacted by the proposed single turbine.
<b>LB 9, 11-16</b> 'B' Listed buildings within Arbirlot	~1.7km	Medium	Low	Moderate/ Minor	The localised setting of the listed buildings is within the village of Arbirlot, creating an immediate urban setting. The hub of the proposed single turbine is theoretically visible in views to the east south-east of the conservation area. The layout of the conservation area is such that the predominant views from the houses are into the surrounding buildings. No significant adverse impacts upon the current setting of the listed buildings are predicted.
<b>LB 10</b> Arbirlot Bridge Over Elliot Water	~1.7km	Medium	Negligible	Minor	The bridge spans the tree-lined Elliot Water, and is located to the north of the A92. The bridge has a currently functional setting that allows a single track road to pass over the river. The proposed single turbine is not expected to adversely impact upon the bridge's current setting.
<b>LB 17 &amp; 20</b>	~1.9km	Medium	Low	Moderate/	Both listed buildings are located within Arbroath. The urban setting of both features creates a secluded

Name	Distance	Sensitivity	Magnitude	Impact	Comment
4&5 Gayfield & St Margaret's Church 'B' listed				Minor	setting with the predominant views from the historic features being into the surrounding townscape. The proposed single turbine is not expected to adversely impact upon the current setting or historical integrity of the listed buildings.
<b>LB 18 &amp; 19</b> Arbroath High School & Water Tower Keptie Hill 'B' listed	~1.8-1.9km	Medium	Negligible	Minor	The full extent of the proposed single turbine is expected to be visible in views to the south-west of the project. Both listed buildings are located within the Keptie Hill conservation area. The localised setting of the conservation area is such that the intervening buildings within the town of Arbroath are expected to prevent long distance views in the direction of the proposed development.
<b>LB 21</b> The Elms	~2.1km	High	Negligible	Moderate/Minor	The localised setting of the house is within the town of Arbroath. The surrounding buildings within the town will prevent long distance views in the direction of the proposed development.
<b>LB 22</b> Ladyloan Bell Rock Lighthouse	~2.2km	High	Negligible	Moderate/Minor	The immediate setting of the lighthouse is on the southern periphery of Arbroath. The predominant views from the lighthouse are out across the North Sea. The tower of the proposed single turbine is expected to be visible in views to the west of the lighthouse. The intervening buildings within the town of Arbroath are expected to prevent any long distance views in the direction of the proposed development.
<b>LB 23</b> Dens Road, Baltic Works	~2.5km	High	Negligible	Moderate/Minor	The current localised setting of the warehouse is such that it is situated in the heart of Arbroath where the intervening buildings within the town are expected to prevent long distance views of the proposed development.
<b>SM 20/ LB 24-28</b> Arbroath Abbey- Pend, Abbot's House, Conventual Building, Abbey Church and Precincts	~2.7km	High	Negligible	Moderate/Minor	The immediate setting of the abbey and its associated buildings is within the abbey's formal grounds. The predominant views from the abbey are into the surrounding townscape of Arbroath's old town. The tower of the proposed single turbine is theoretically fully visible in views to the south-west of the abbey. It is expected that the surrounding buildings that characterise the abbey's setting, will prevent long distance views in the direction of the proposed development. No significant adverse impacts upon the abbey's current urban setting are predicted.

Name	Distance	Sensitivity	Magnitude	Impact	Comment
<b>LB 29 St.</b> Vigeans Parish Kirk	~3.4km	High	Negligible	Moderate/ Minor	The localised setting of the kirk is upon the banks of the Brothock Water, immediately adjacent to a railway line. The current localised setting of the kirk is not expected to be adversely impacted by the proposed development.
<b>SM 1-15</b>	~1.1- 4.7km	High	Negligible	Moderate/ Minor	The current setting of each of these features is within modern agricultural fields to the south-west and west of the proposed development. Although each of these features has theoretical views of the proposed development they remain as sub-surface features that are subject to intense agricultural practices. The turbine will be viewed in conjunction with the industrial features associated with the area and back dropped by the built up settlement of Arbroath. No adverse impact upon the current setting of these features is predicted.
<b>SM 16 &amp; SM 17</b>	~3.4-4km	High	Negligible	Moderate/ Minor	There is no theoretical visibility from these features therefore visual impact is not considered to be a significant concern.
<b>SM 18</b> Souterrain Eastern Cemetery	~3.3km	High	Negligible	Moderate/ Minor	The localised setting of the souterrain is within a cemetery on the northern periphery of Arbroath. The buildings within the intervening townscape are predicted to prevent long distance views of the proposed development.
<b>SM 19</b> Dickmount Law, cairn	~4.9km	High	Negligible	Moderate/ Minor	The localised setting of the cairn is upon a modern field boundary. The intervening townscape of Arbroath is expected to prevent long distance views in the direction of the single turbine.
<b>SM 21</b> Arbirlot, carved stone	~1.8km	High	Negligible	Moderate/ Minor	The current localised setting of the SM is within the village of Arbirlot. The surrounding houses within the town are expected to prevent long distance views both to and from the carved stone.
<b>GDL 1</b> The Guynd	~4.3km	High	Negligible	Moderate/ Minor	The full extent of the proposed single turbine is expected to be visible in views to the east south-east of the gardens. The turbine is theoretically visible from the majority of the GDL, with the exception of the south-easterly corner. The garden's mature woodland shelter belts to the east and south-east are expected to prevent any long distance views in the direction of the proposed development. Furthermore, at this distance the proposed single turbine is expected to appear as part of the wider landscape. No significant adverse impacts upon the current setting or historical integrity of the proposed development are predicted.
<b>CA 1</b> Arbroath Keptie Pond	~1.6km	Medium	Negligible	Minor	The full extent of the proposed turbine is expected to be visible in views to the south-west of the proposed single turbine. The conservation area spans the Keptie Pond area within the town of Arbroath. The conservation area is bordered by roads on the north and east and the surrounding town of Arbroath to the west. The intervening townscape of Arbroath is expected to prevent any long distance views in the direction of the proposed single turbine. No significant adverse impacts upon the current setting or historical integrity of the conservation are predicted.
<b>CA 2</b>	~1.6km	Medium	Low	Moderate/	The orientation of the buildings within the conservation area suggests that the predominant views from

Name	Distance	Sensitivity	Magnitude	Impact	Comment
Arbirlot				Minor	the feature are into the conservation area itself. The current setting of the conservation area is characterised by its location upon the banks of the tree lined Elliot Water. The tower of the proposed single turbine is expected to be visible in views to the east south-east of the conservation area. No significant adverse impacts upon the current setting of the conservation area are predicted.

## **9.7 Mitigation Incorporated into the Proposed Development**

Planning guidance (SPP – Historic Environment) states that it is Government policy to protect and preserve archaeological sites and monuments in situ wherever feasible. Where preservation in-situ is not possible planning authorities should ensure that an appropriate level of excavation, recording, analysis, publication and archiving is carried out before and/or during development.

### **Permanent Land-take and Operation**

The proposed turbine location, access and other aspects of development avoid the locations of known features of cultural heritage interest and as such no direct impact has been identified.

While this assessment has found no indication of the survival of any archaeological features or deposits that are not visible above ground level, it is nevertheless possible that such features do exist within the application area, although this is considered unlikely due to the industrial nature of the site.

In the event that archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of the planning authority.

### **Restoration**

No restoration measures are currently proposed.

## **9.8 Summary of Predicted Impacts and Effects**

### **Direct Impact**

No direct impact has been identified on any feature of cultural heritage interest, according to current proposals. In the event that archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of the planning authority.

### **Indirect Visual Impact**

#### **2km study radius**

The study has found 2 conservation areas, 18 'B' listed buildings, 2 'A' listed buildings and 3 SMs within 2km of the proposed wind turbine. No Inventory Battlefields, World Heritage Sites or GDLs were found to fall within this radius.

Only one 'Moderate' impact is predicted, at the closest feature of 'High' sensitivity to the turbine – Hospitalfield House, which has an associated Fernery and Doocot. The current setting of the house is such that the Elliot Industrial Estate, the Westway Retail Park and modern residential areas are all features of current views to the south-west. The turbine will be visible to the left of the telecommunications mast, and appear of a similar scale to this structure. It is not considered to detract from the current setting of the Hospitalfield House, which is also characterised by the belt of mature trees that surround the house and grounds to the west.



The next closest feature is Kelly Castle. The Castle's associated mature woodlands are expected to restrict potential views of the development at ground level and again a low impact is predicted.

The conservation area of Arbirlot spans the village of Arbirlot and encompasses a number of 'B' listed buildings.. The layout of the conservation area is such that the predominant views from the features are contained within the surrounding buildings of the village.

Of the remaining features within 2km, none are expected to experience more than a 'Low' magnitude of change as a result of the development.

### **5km study radius**

Within 5km of the project an additional 8 'A' listed buildings, 18 SMs and a GDL were identified. No World Heritage Sites or Inventory Battlefields are located within 5km of the proposed turbine. All of these features are expected to experience a 'Negligible' magnitude of change as a result of the development.

The magnitude of indirect visual impact on cultural sites beyond 5km from the single wind turbine is assessed to be **negligible**. The intervening distance will result in the single wind turbine appearing as part of the wider landscape where the quality of the setting could be altered to a small degree.

## **9.9 Conclusion**

No direct effect has been identified on any known features of cultural heritage interest according to current proposals. The potential for development to encounter previously unrecorded features is considered to be unlikely being limited by the small extent of intrusive works associated with the proposed development.

The proposed single turbine has been assessed as having an overall **low** impact upon Hospitalfield House (LB 1). With regards to the other features of historical significance within 5km, the proposed development is expected to have a **negligible** or **low** level of effect upon their current settings. Therefore the proposed development is not predicted to cause significant adverse impact on the cultural heritage assets within the surrounding area

## **10 Surface and Groundwater Hydrology**

### **10.1 Background**

A surface water drainage system is already in place on the application site which has been approved by the Scottish Environment Protection Agency (SEPA) and Angus Council.

### **10.2 Evaluation**

The drainage of the small area of the development outside the current Bairds boundary will be tied back into the Bairds Malt drainage system.

The majority of potentially significant negative impacts on water quality are only predicted to occur in the short term through potential increased sedimentation and construction pollution during the construction phase. The adoption of best practice management and control procedures by all site personnel will bring any risks down to acceptable levels.

### **10.3 Conclusion**

This element has been scoped out of the Environmental Report and no further assessment/consideration is deemed to be required. Any further revisions to the existing surface water drainage system will be implemented simultaneously with the development and will be approved to the satisfaction of Angus Council and prior to any construction activities taking place.

## 11 Existing Infrastructure, Telecommunications, Television, Aviation and Electromagnetic Interference

### 11.1 Introduction

Operational wind turbines have the potential to interfere with:

- Communication networks that use electromagnetic signals;
- Civil aviation radars;
- Safeguarding radars operated by the MOD; and
- Other types of infrastructure such as high pressure gas, water pipes or electricity lines and cables.

The potential impact of the proposed wind turbines on this infrastructure is considered in this chapter.

### 11.2 Guidance

Guidance for assessing the potential impact of wind turbines on electromagnetic infrastructure is given in:

- Scottish Planning Policy, Subject Policy: *Renewable Energy*, Scottish Government, 2010;
- Tall structures and their impact on broadcast and other wireless systems, Ofcom, 2009; and
- Wind farms assessment tool, BBC

Guidelines and publications for assessing potential impact on aviation activities are:

- Wind Energy and Aviation Interim Guidelines, BWEA, 2002;
- CAP 428 - Safety Standards at Unlicensed Aerodromes, CAA, 2004; and
- CAP 764 – Policy and Guidelines on Wind Turbines, CAA, 2012.

### 11.3 Methodology

A list of consultees with aviation, telecommunications, television and other infrastructure interests in the area was identified based upon advice given in Scottish Planning Policy. These consultees are listed in **Table 11.1**.

**Table 11.1 – Infrastructure, telecommunications and other infrastructure consultation**

<b>Consultee</b>	<b>Comments</b>
<b>Aviation</b>	
CAA	No issues expected
MOD	Objection expected on basis of RAF Leuchars
BAA	No issues expected
NATS	No issues expected
<b>Telecommunications</b>	
Ofcom	Identified the interested operators below
Atkins	No objection
Ericsson	No objection
JRC	No objection
Orange	No objection
Scottish and Southern Energy	No objection

## 11.4 *Assessment of Impact*

### **Civil aviation**

An independent aviation study commissioned by the client has established that there are not expected to be any conflicts with civil aviation.

### **Ministry of Defence (MOD)**

An independent aviation study has identified that the turbine is likely to be visible to the radar at RAF Leuchars, which may trigger an initial objection.

Should this be the case, it is proposed that an in-fill radar solution be developed by a specialist aviation consultancy and agreed with the MoD. This approach was successfully adopted for the Govals Wind Farm, with the MoD content to make the successful implementation of such a scheme a condition of planning.

**Telecommunications**

Ofcom identified five companies with links in the vicinity of the proposed development. All of the identified link providers were consulted with the details of the proposal and responded with no objections.

**Other infrastructure**

No underground services or overhead power lines have been identified within the vicinity of the proposed wind turbines.

**Television**

The digital switchover for the whole of the UK has been completed.

A 2009 Ofcom report stated that:

*“Digital television signals are much better at coping with signal reflections, and digital television pictures do not suffer from ghosting. However a digital receiver that has to deal with reflections needs a somewhat higher signal level than one that has to deal with the direct path only. This can mean that viewers in areas where digital signals are fairly weak can experience interruptions to their reception should new reflections appear.*

*Over time, this problem is expected to diminish as the power of transmitters is increased as digital switchover continues across the UK. However, higher transmitter powers will not be a solution in all situations which means that reflections may still affect digital television reception in some areas, although the extent of the problem should be far less than for analogue television.”*

There are a number of technical solutions available should interference be proven as an issue as a result of the turbines. If in the unlikely event that there are any impacts, these would be of a temporary nature until a technical alternative can be put in place. Overall, any potential effects on television are considered to be negligible.

**11.5 Impacts, Issues and Mitigating Actions**

There is a possibility that the MoD is likely to object to the turbine based upon the potential impact to the radar at RAF Leuchars. Negotiations with the MoD will be undertaken post-submission, if required. There is a high level of confidence that suitable mitigation measures can be agreed, as was successfully taken forward for the Govals Wind Farm.

## 11.6 References

British Wind and Energy Association (BWEA), Civil Aviation Authority (CAA), Department of Trade and Industry (DTI), (2002), *Wind Energy and Aviation Interests – Interim Guidelines*, BWEA, CAA, DTI.

Civil Aviation Authority (2004), *CAP 428 – Safety Standard at Unlicensed Aerodromes (Including Helicopter Landing Sites)*, Civil Aviation Authority.

Civil Aviation Authority (2012), *CAP 764 – CAA Policy and Guideline on Wind Turbines*, Civil Aviation Authority.

*digitaluk* <http://www.digitaluk.co.uk/> (accessed October 2013)

Ofcom (2009), *Tall structures and their impact on broadcast and other wireless services*, Ofcom.

Scottish Government (2010), *Scottish Planning Policy*, Scottish Government.

## 12 Shadow Flicker

This section of the report looks at potential for shadow flicker impacts on residential, commercial and industrial properties.

### 12.1 Background

Tall structures such as wind turbines cast shadows. These shadows vary in length according to the sun's altitude and azimuthal position. Under certain combinations of geographical position and time of day, the sun may pass behind the rotor of a wind turbine and cast a moving shadow over neighbouring properties. Where this shadow passes over a narrow opening such as a window, the light levels within the room affected will decrease and increase as the blades rotate, hence the shadow causes light levels to 'flicker' - an effect commonly known as 'shadow flicker'.

Whilst the moving shadow can occur outside, the shadow flicker effect is only experienced inside buildings where the shadow passes over a narrow window opening. The seasonal duration of this effect can be calculated from the geometry of the machine and the latitude of the site. A single window in a single building is likely to be affected for a few minutes at certain times of the day for short periods of the year. The likelihood of this occurring and the duration of such an effect depend upon:

- The direction of the property relative to the turbine(s);
- The distance from the turbine(s);
- The turbine hub-height and rotor diameter;
- The time of year;
- The proportion of day-light hours in which the turbine operates;
- The frequency of bright sunshine and cloudless skies (particularly at low elevations above the horizon); and
- The prevailing wind direction.

The further the property is from the turbine the less pronounced the effect will be. There are several reasons for this:

- There are fewer times when the sun is low enough to cast a long shadow;
- When the sun is low it is more likely to be obscured by either cloud on the horizon or intervening buildings and vegetation; and,
- The centre of the rotor's shadow passes more quickly over the land reducing the duration of the effect.

At a distance, the blades do not cover the sun but only partly mask it, substantially weakening the shadow. This effect occurs first with the shadow from the blade tip, the tips being thinner in section than the rest of the blade. The shadows from the tips extend the furthest and so only a weak effect is observed at a distance from the turbines.



## 12.2 Methodology

### Guidance

As confirmed by DECC's Report 'Update of UK Shadow Flicker Evidence Base'<sup>10</sup>, there is no standard UK Guidance on acceptable levels of shadow flicker. The only guidance that provides suggested levels is Northern Ireland's Best Practice Guidance to Renewable Energy<sup>11</sup>, which recommends that shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year. This position is based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply which draws on experience from Belgium, Denmark, France, the Netherlands and Germany.

The Scottish Government's online planning guidance for renewable energy, specifically the 'Onshore Wind Turbines' note last updated in October 2012, states that,

*"Where this (shadow flicker) could be a problem, developers should provide calculations to quantify the effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem..."*

The Northern Ireland Guidance also states that, *"Shadow flicker generally only occurs in relative proximity to sites and has only been recorded occasionally at one site in the UK. Only properties within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK – turbines do not cast long shadows on their southern side."*

### Approach

The following approach has been adopted, which takes into account the Guidance discussed above:

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<sup>10</sup> Update of UK Shadow Flicker Evidence Base, DECC (2011)

<http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/ORED/1416-update-uk-shadow-flicker-evidence-base.pdf>

<sup>11</sup> Best Practice Guidance to Planning Policy Statement 18: Renewable Energy, Department of the Environment (Northern Ireland), (2009).

[http://www.planningni.gov.uk/index/policy/policy\\_publications/planning\\_statements/planning\\_policy\\_statement\\_18\\_renewable\\_energy\\_best\\_practice\\_guidance.pdf](http://www.planningni.gov.uk/index/policy/policy_publications/planning_statements/planning_policy_statement_18_renewable_energy_best_practice_guidance.pdf)

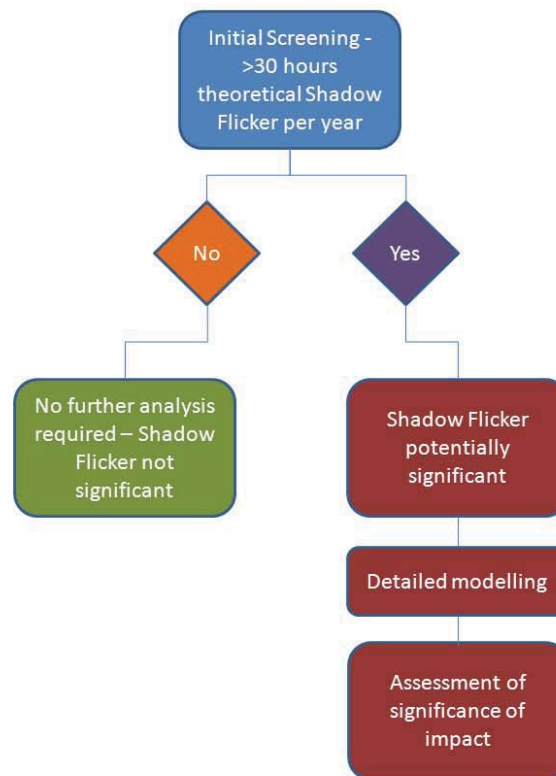


Figure 12.1 – Process for assessment of Shadow Flicker

### Windfarm Model

ReSoft’s WindFarm software has been used to calculate theoretical levels of shadow flicker. This software models shadow flicker effects by using simple geometric considerations: the position of the sun at a given date and time; the size and orientation of the windows that may be affected; and the size of the turbine that may cast the shadows. The model adopts a worst case approach by assuming that:

- The turbine is facing the sun at all times of the day;
- It is always sunny;
- The turbine is always operating; and
- There is no local screening.

### Realistic Levels of Shadow Flicker

Realistic levels of shadow flicker have been calculated using the theoretical figures as a base. These realistic levels take into account actual annual hours of sunlight for the area, hours of turbine operation, and the average yaw angle of the turbine.

The mitigation factors are derived from the following:

- The average sunlight hours for the Arbroath area which is ~1,564 hours. This has been estimated from the 1981-2010 met office data for Leuchars. Therefore, on average it is sunny for ~35% of the daylight hours.
- The rotor of a modern wind turbine can be expected to turn approximately 90% of the time.
- According to the Danish Wind Energy Association website, shadow flicker is reduced to 63% of the maximum possible if the wind turbine is assumed to be randomly yawed relative to the sun position.

The realistic results are therefore 20% of the uncorrected total ( $0.35 \times 0.90 \times 0.63 = 0.20$ ). The assessment of significance is based upon these realistic levels.

### Sensitivity of receptors

The area surrounding Bairds Malt contains residential, commercial and industrial receptors. It is difficult to assign a general level of sensitivity for each group of receptors as the sensitivity of each receptor is generally building specific, and will depend upon the use of the rooms that are affected, the level of shading surrounding the property and how susceptible the receptor is to light flicker. All of the receptors have therefore been assumed to be of a High sensitivity.

Where shadow flicker occurs outside of the hours 8am to 6pm then this has been noted. Similarly, where premises are un-occupied over the weekend then shadow flicker would not be an issue. This consideration has not been taken into account in the assessment, but would become pertinent when calculating turbine shut-down times should a turbine shut-down strategy be required.

### Assessment of Significance

The following impact assessment matrix has been devised based on this guidance and professional judgement, and is presented below in **Table 12.1**.

**Table 12.1 – Assessment Matrix**

Sensitivity	Magnitude of Change (Realistic total shadow flicker duration per year)			
	High (>30 hours per year)	Medium (>6 and <30 hours per year)	Negligible (<6 hours)	None
High	Major	Moderate	Minor	Negligible / None

The threshold for negligible impact has been set at the 30 theoretical hours when mitigating factors are taken into account –  $30 \text{ hours} \times 0.2 = 6 \text{ hours}$  realistic shadow flicker.

### 12.3 Screening of Receptors

The WindFarm model was run to identify those receptors where the theoretical shadow flicker impact is greater than 30 hours per year. The results of this exercise are shown in **Figure 12.2 (Appendix 5)**. Further information on each receptor is provided below.

**Peasiehill Cottages (1 and 20)**

**South-eastern façade of the properties, which face the turbine**

Description of receptor	Two semi-detached single storey residential properties. Although outside the zone of 30 hours influence, these are the closest residential properties to the turbine, and have therefore been included in the assessment.
Type of receptor	Residential
Distance to turbine	310m
Main orientation of receptor	South-west, towards turbine.
Number of windows affected	Two per property, facing towards the turbine.
Screening	No
Considered further within assessment?	Yes

## PAF 1 (2)



The northern façade of the property facing away from the turbine



Typical photograph of the shelter belt of trees to the south of Patrick Allan Fraser Street

Description of receptor	The closest semi-detached single storey property in the south-west corner of the housing estate.
Type of receptor	Residential
Distance to turbine	350m
Main orientation of receptor	North, away from turbine. Rear of the property faces south, towards the turbine.
Number of windows affected	Two on the rear of the property.
Screening	A belt of deciduous trees to the south of the property would offer screening in the months when foliage is present.
Considered further within assessment?	Yes



## PAF 2 (3)



The northern façade of the house, which faces away from the turbine. Shelter belt of trees visible to the rear.

Description of receptor	Semi-detached single storey property on the southern edge of Patrick Allan Fraser Street.
Type of receptor	Residential
Distance to turbine	390m
Main orientation of receptor	North, away from turbine. Rear of the property faces south, towards the turbine.
Number of windows affected	Two on the rear of the property.
Screening	A belt of deciduous trees to the south of the property would offer screening in the months when foliage is present.
Considered further within assessment?	Yes

## PAF 3 (4)



The northern façade of the house, which faces away from the turbine. Shelter belt of trees visible to the rear.

Description of receptor	Semi-detached single storey property on the southern-eastern edge of Patrick Allan Fraser Street. The front of the property faces away from the turbine.
Type of receptor	Residential
Distance to turbine	400m
Main orientation of receptor	North, away from turbine. Rear of the property faces south, towards the turbine.
Number of windows affected	Two on the rear of the property.
Screening	A belt of deciduous trees to the south of the property would offer screening in the months when foliage is present.
Considered further within assessment?	Yes



## PAF 3 (5)



The southern façade of the house which faces the turbine

Description of receptor	Detached single storey property on Patrick Allan Fraser Street. The property's main views are towards the turbine.
Type of receptor	Residential
Distance to turbine	430m
Main orientation of receptor	South, towards the turbine.
Number of windows affected	Two on the front of the property.
Screening	None
Considered further within assessment?	Yes

## SRCL (6)



The southern façade of the unit, which faces the turbine.

Description of receptor	Single storey industrial unit.
Type of receptor	Industrial
Distance to turbine	180m
Main orientation of receptor	North-east, away from the turbine.
Number of windows affected	None
Screening	-
Considered further within assessment?	No

## Tayside Doors (7)



**Main façade of industrial units showing potentially affected windows.**

Description of receptor	Two industrial units with the main facades orientated in a south-westerly direction, oblique to the turbine.
Type of receptor	Industrial
Distance to turbine	220m
Main orientation of receptor	South-west, obliquely towards the turbine.
Number of windows affected	16 small windows which are currently barred. The windows appear to be associated with warehouse space.
Screening	None
Considered further within assessment?	Yes

**Elliott Business Park (8)**

Northern portion of the south-eastern façade of the Business Park offices



Southern portion of the south-eastern façade of the Business Park offices

Description of receptor	Large warehouse with office facilities in the south-western portion. These premises are currently unoccupied.
Type of receptor	Industrial / Commercial
Distance to turbine	260m
Main orientation of receptor	South-east, oblique to the turbine.
Number of windows affected	No windows on the south-western façade, which provides access to the warehousing facility. Strip of windows ~75m in length across most of the SSW face could potentially be affected by shadow flicker.
Screening	None.
Considered further within assessment?	Yes



**Smithy (9)**

**South-western façade of the Smithy premises which is oblique to the turbine.**

Description of receptor	Single storey building with yard being used to store containers. It is not known whether this building is currently in use.
Type of receptor	Industrial
Distance to turbine	370m
Main orientation of receptor	South-west, obliquely towards the turbine.
Number of windows potentially affected	Four windows. These are currently barred.
Screening	None
Considered further within assessment?	Yes

**Mackays (10)**

**South-western façade of the premises, oblique to the turbine**

Description of receptor	Distribution Warehouse and Factory Shop.
Type of receptor	Industrial
Distance to turbine	210m
Main orientation of receptor	North-west, away from the turbine.
Number of windows potentially affected	None.
Screening	-
Considered further within assessment?	No

**NETDWES Self Storage (11)**

Photograph of the northern façade of the property. Western façade is to the right of the picture

Description of receptor	Single storey warehouse
Type of receptor	Industrial
Distance to turbine	310m
Main orientation of receptor	South-west, obliquely towards the turbine.
Number of windows potentially affected	None. Large warehouse entrance is on the façade.
Screening	-
Considered further within assessment?	No

**Halliburton 1 (12)**

Description of receptor	Large single storey warehouse
Type of receptor	Industrial
Distance to turbine	170m
Main orientation of receptor	South-east, oblique to the turbine.
Number of windows potentially affected	None.
Screening	-
Considered further within assessment?	No



**Halliburton 2 (13)**

North-western façade of the property facing obliquely away from the turbine.



South-western façade of the premises, facing towards the turbine. One window is visible halfway up the left edge of the building.

Description of receptor	Large warehouse structure
Type of receptor	Industrial
Distance to turbine	90m
Main orientation of receptor	North-west, oblique to the turbine.
Number of windows potentially affected	Three on the north-western façade, one on the south-western façade.
Screening	A large coniferous hedge is located ~15m to the west of the building.
Considered further within assessment?	Yes

**Halliburton Offices (14)**

**South-western façade of the building. The offices are visible in the distance, between the two large warehouses.**

Description of receptor	Large 'U' shaped building. The northern and southern wings are large warehouse structures with no windows. The eastern part of the building, the rear of which faces the turbine, comprises three storeys of office space.
Type of receptor	Industrial / Commercial
Distance to turbine	260m (Offices)
Main orientation of receptor	South-west towards the turbines (offices)
Number of windows potentially affected	16 windows split over three floors.
Screening	None
Considered further within assessment?	Yes

## Energy Alloys (15)



The northern aspect of the premises. The large warehouse is towards the rear of the picture. The offices are located in the grey brick building to the left of the picture.

Description of receptor	Large warehouse complex, with office premises to the east.
Type of receptor	Industrial / Commercial
Distance to turbine	330m (Offices)
Main orientation of receptor	North-west oblique to the turbine.
Number of windows potentially affected	The office premises have a single second-storey window in the aspect facing the turbine location.
Screening	None
Considered further within assessment?	Yes

**Masstock (16)**

**South-western façade of the building which faces the turbine**

Description of receptor	Single storey warehouse type building with offices in the northern half.
Type of receptor	Industrial / Commercial
Distance to turbine	350m
Main orientation of receptor	North-east away from the turbine.
Number of windows potentially affected	None
Screening	-
Considered further within assessment?	No

**Buildbase (17)**

The north-eastern façade of the building, facing away from the turbine

Description of receptor	Single storey warehouse type building with a small office on the eastern aspect.
Type of receptor	Industrial / Commercial
Distance to turbine	330m
Main orientation of receptor	North-east away from the turbine.
Number of windows potentially affected	None
Screening	-
Considered further within assessment?	No



**Halliburton 4 (18)**

The eastern façade of the building, facing away from the turbine.

Description of receptor	Single storey warehouse type building with offices on the eastern side.
Type of receptor	Industrial / Commercial
Distance to turbine	340m
Main orientation of receptor	North-east away from the turbine.
Number of windows potentially affected	None
Screening	-
Considered further within assessment?	No

**PMP Interplex (19)**

The north-western façade of the building showing the commercial offices.

Description of receptor	Warehousing and offices. The offices are located on the north-western side of the building over two floors.
Type of receptor	Industrial / Commercial
Distance to turbine	360m
Main orientation of receptor	North-west obliquely towards the turbine.
Number of windows potentially affected	All of the windows on the north-western façade covering a distance of around 50m.
Screening	None.
Considered further within assessment?	Yes

**Detailed Shadow Flicker analysis**

For each of the receptors carried forward for detailed assessment, the windows with the potential to be affected by shadow flicker have been modelled within WindFarm software. The size, orientation and position of each window has been coded using:

- Photographs taken on-site.
- Imagery available on Google Earth; and
- OS Mapping imported in to WindFarm.

**12.4 Results and Assessment**

The calculation results, both theoretical and realistic, along with the resulting impact assessment based on the assessment matrix above, are given in **Table 12.3** below.



Table 12.3 – Results and Impact Assessment

Shadow Flicker Impact Assessment							
ID	Name	Sensitivity	Number of days	Mean hours per day	Total hours per year		Impact (Based on mitigated levels)
					Theoretical	Realistic	
1R	Peasiehill Cottages (S)	High	50	0.5	25.7	5.1	Minor
2R	PAF1	High	59	0.55	32.7	6.5	Moderate
3R	PAF2	High	50	0.44	22.0	4.4	Minor
4R	PAF3	High	62	0.48	29.8	6.0	Minor
5R	PAF4	High	30	0.61	9.3	1.9	Minor
7I	Tayside Doors	Low	113	1.05	118.6	23.7	Moderate
8C	Elliott Business Park	High	104	1.20	124.6	25.0	Moderate
9I	Smithy	Low	84	0.41	34.2	6.8	Minor
<b>13I</b>	<b>Halliburton 2</b>	<b>Low</b>	<b>183</b>	<b>1.26</b>	<b>231.3</b>	<b>46.0</b>	<b>Major</b>
14C	Halliburton Offices	High	77	.80	61.9	12.4	Moderate
15C	Energy Alloys	High	55	0.43	23.6	4.7	Minor
19C	PMP Interplex	High	67	0.55	36.5	7.3	Minor
20R	Peasiehill Cottages (N)	High	50	0.51	25.7	5.1	Minor

R=Residential, I=Industrial, C=Commercial

A discussion of the results is provided below.

### Residential Properties

- The highest theoretical impact at a **residential property** is 32.7 hours per year, at PAF 1. This amounts to 6.5 hours of predicted shadow flicker impact when more realistic results are considered. This has been assessed as a **Moderate** impact. This property is screened from the turbine by a shelter belt of trees which would further mitigate impacts.
- The remaining five residential properties assessed are all predicted to have theoretical levels of shadow flicker of under 30 hours per year, falling to less than 6 hours when realistic factors are considered. This has been assessed as a **Minor** impact. All of the properties on the southern-edge of Patrick Allan Fraser Street are expected to receive screening from the belt of trees to the south of the estate. This will be more substantial in the months when the trees are in leaf.

### Commercial Properties

- The highest theoretical impact at a **commercial property** is 124.6 hours per year, at Elliott Business Park. This amounts to 25 hours of predicted shadow flicker impact when more realistic results are considered, which has been assessed as a **Moderate** impact. This property does not appear to be currently occupied.
- The remaining commercial properties are expected to receive lower levels of shadow flicker. The impact on the Halliburton Offices has been assessed as **Moderate**, with **Minor** impacts at Energy alloys and PMP Interplex.

### Industrial Properties

- The highest theoretical impact at an **industrial property** is 231 hours per year, at Halliburton 2, which is the closest building to the turbine. This amounts to 46 hours of predicted shadow flicker impact when more realistic results are considered, which has been assessed as a **Major** impact.
- Tayside Doors has been assessed as experiencing a **Moderate** impact, with 23.7 hours of realistic shadow flicker impacts predicted per year. The predicted impacts on the Smithy have been assessed as **Minor**.

### 12.5 Mitigation

DECC has stated that, *“Mitigation measures which have been employed to operational wind farms such as turbine shut down strategies, have proved very successful, to the extent that shadow flicker cannot be considered to be a major issue in the UK”<sup>12</sup>.*

There are four main mitigation measures that can be applied to reduce shadow flicker effects:

- Careful site design to minimise impacts;
- Implementation of a turbine shut-down strategy;
- The installation of blinds at affected properties; and
- Landscaping or the planting of vegetation to provide screening.

The biggest predicted impact (realistic total) at the Halliburton warehouse equates to 2.9% of annual daylight hours (46 / 1,564). Given the findings of this assessment, no mitigation measures are proposed at this stage.

It is recommended that a watching brief be undertaken throughout the first year of the turbine’s operation to establish whether shadow flicker is problematic at any particular locations and at any particular times of the year.

Should shadow flicker be a concern for the Local Authority (for residential, commercial or industrial locations), then the simplest option would be to install blinds at affected premises, with the agreement of the owner / occupier. This would be an effective, low cost solution, and would be the applicant’s preferred option.

Alternatively, a turbine shut down strategy could be agreed at the post-planning stage which would automatically stop the turbine during particular combinations of date, time and turbine position and when light levels are such that shadow flicker could occur and cause nuisance.

Enercon wind turbines, such as the E44 model proposed for this site, have a shadow shut off system integrated within their control system. The predicted theoretical times of shadow flicker nuisance, as modelled using ReSoft’s WindFarm software, are programmed into the

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<sup>12</sup> Update of UK Shadow Flicker Evidence Base’ Department of Energy and Climate Change (2011)

control system as a table, which includes the daily start and end times of theoretical shadow flicker.

The turbine would be fitted with three light sensors spaced at 120° angles to ensure that one sensor is always exposed towards the orientation of the sun, and one is always on the shaded side of the turbine. Based on the measured values of the sensors, the control system determines the ratio between the level of highest and lowest illumination, known as the shut-off intensity.

The shutdown procedure is activated under the following conditions:

- When luminance from the sun is 120 W/m<sup>2</sup> or greater; and
- Shut-off intensity is 36% or less.

When both of these criteria are met within the timeframes programmed into the turbine from the shadow flicker model, the turbine will proceed to shut down.

## **12.6 Conclusion**

A detailed assessment of potential shadow flicker impacts has been undertaken in the area around the proposed Bairds Malt turbine. This has considered the impact on residential, commercial and industrial premises.

Taking into account realistic assumptions relating to actual sunlight hours and turbine orientation, shadow flicker impacts are not expected to exceed 6.5 hours per year at the nearest residential properties to the proposed Bairds Malt turbine. Given these results, shadow flicker is not expected to be a nuisance at any residential properties.

The biggest predicted impact at a commercial property (which currently appears to be vacant) is 25 hours per year. The worst affected industrial property is predicted to experience 46 hours of shadow flicker impact per year, which equates to 2.9% of daylight hours (46/1,564).

Given the findings of the assessment, no further mitigation is proposed at this stage, but a watching brief is recommended throughout the turbine's first year of operation. Should Angus Council consider shadow flicker to be an issue then it is proposed that suitable mitigation measures be agreed at the post-planning stage, comprising of either the installation of blinds at affected premises or the development of a turbine shut-down strategy.

## 13 The Carbon Balance

This section considers the impact of the proposed wind turbine on climate change.

### 13.1 Introduction

The UK and Scottish Governments have developed ambitious targets for tackling climate change:

- The UK Government in the 2008 Climate Change Act made a commitment to reduce the UK's emissions of CO<sub>2</sub> by 34% (on 1990 levels) by 2020 and 80% by 2050.
- The Climate Change (Scotland) Act 2009 sets in statute the Government's Economic Strategy target to reduce Scotland's emissions of greenhouse gases by 80% by 2050 (on 1990 levels), with an interim reduction target of at least 42%. These targets will be achieved through an investment in energy efficiency and clean technologies such as renewable energy generation.

The Scottish Government has developed a Climate Change Programme which sets a goal of generating the equivalent of 100% of Scotland's electricity demand by renewable means by 2020, with an interim target of 50% by 2015<sup>13</sup>. The vast majority of this new target is still expected to be met by hydro and by onshore wind.

New developments will continue to be implemented through the Renewables Obligation (Scotland) on all licensed electricity suppliers in Scotland, and through other incentives such as the Feed in Tariff (FiT).

### 13.2 Potential Impacts

The main greenhouse gas pollutants associated with conventional power stations include: carbon dioxide (CO<sub>2</sub>); sulphur dioxide (SO<sub>2</sub>); and oxides of nitrogen (NO<sub>x</sub>).

The following table, which has been adapted from SNH guidance, summarises the potential CO<sub>2</sub> savings and costs associated with different aspects of each wind development:

**Table 13.1 – Carbon savings / losses associated with wind developments**

Potential Carbon Savings	Potential Carbon Losses
Carbon emission savings when compared to emissions from different power sources	Production, transportation, erection, operation and decommissioning of the wind turbine
Improvement of habitat	Requirement for backup power generation
	Loss of carbon fixing potential of peatland
Loss and/or saving of carbon stored in peatland (by peat removal or changes in drainage)	
Loss and / or saving of carbon fixing potential as a result of forestry clearance	

In assessing the overall impact of the project on climate change, the full lifecycle of the wind turbines need to be considered. The remainder of this section quantifies each of the different elements presented above.

<sup>13</sup> Renewable Routemap for Scotland - Update October 2012, The Scottish Government.

### 13.3 Guidance

This section has been written with reference to the following technical guidance:

- SNH Technical Guidance Note, 2.0.1, 2011<sup>14</sup>; and
- ‘Onshore Wind Energy Figures’<sup>15</sup>, Renewables UK (Accessed: November 2013).

SNH published a Technical Guidance Note in 2003 for calculating carbon ‘payback’ times for wind farms. The 2003 guidance adopted a relatively simple approach towards impacts on peatland hydrology and stability. The 2011 Technical Guidance Note presents a more comprehensive approach towards these issues.

#### Baseline Data

The annual carbon dioxide emissions saving of a wind turbine are estimated as:

$$CO_2 \text{ emissions saving} = \frac{\text{total electricity generation expected [MWh]}}{\text{Emission Factor of Displaced Generation [tCO}_2\text{/MWh]}}$$

The SNH Technical Guidance Note states that, “**in most circumstances it is not possible to define the electricity source for which a renewable electricity project will substitute**”, although it does state that as nuclear power generation is not affected by renewable energy generation “**this suggests that carbon emission savings from wind farms should be calculated using the fossil fuel sourced grid mix as the counterfactual**” SNH’s Technical Note presents result for each of the three sets of figures, as shown in **Table 13.2**.

**Table 13.2 – Counterfactual emission factors**

Energy	Emission Factor (tCO <sub>2</sub> per mWh) <sup>16</sup>
Grid Mix	0.43
Coal Fired	0.86
Fossil Fuel Mix	0.607

Within this section, the predicted carbon savings against both the Grid Mix and the Fossil Fuel Mix are presented. The Grid Mix figures present a more conservative estimate of CO<sub>2</sub> emission savings.

<sup>14</sup> <http://www.scotland.gov.uk/Resource/Doc/917/0120448.pdf>

<sup>15</sup> Renewable website –Onshore Wind Energy Figures, <http://www.renewableuk.com/en/renewable-energy/wind-energy/onshore-wind/index.cfm>, accessed November 2013

<sup>16</sup> Table 2, SNH Technical Guidance Note, 2.0.1, 2011

### Capacity Factor

A wind project capacity factor has to be determined in order for the total electricity generation of the wind project to be calculated. This is the ratio of the actual energy generated to the theoretical amount that the machine would generate if running at full rated power during a given period of time. The average capacity factor observed for the onshore wind farms in the UK between 2007 and 2012 is 26.2%<sup>17</sup>. The Scottish average is believed to be better thanks to more frequent and higher wind speeds, and in 2012 this was 32%<sup>18</sup>. The UK average in 2013 was 28.9%, and it is this information which has been used in the calculations below.

## 13.4 Carbon balance

### Project CO<sub>2</sub> emission savings

The calculation was carried out in accordance with SNH Technical Note version 2.0.1, 2011<sup>19</sup>, using the overall grid mix and fossil fuel sourced grid mix figures to produce the counterfactuals for comparison. Results are presented in **Table 13.3**.

Power Generation Characteristics	
Number of turbines	1
Total installed capacity	0.9MW
Capacity Factor	29%
Lifetime	25 years
<b>Annual Energy Output</b>	<b>~2,300 MWh/yr</b>

Counterfactual Emissions Factors	
Overall 'grid' mix generation	0.43 tCO <sub>2</sub> /MWh
Fossil fuel sourced mix	0.607 tCO <sub>2</sub> /MWh

Project estimated CO <sub>2</sub> emission savings over:	tCO <sub>2</sub> /yr	tCO <sub>2</sub> /25yr
Grid mix generation	983	24,600
Fossil fuel mix generation	1,388	34,700

Assuming 1 tCO<sub>2</sub> = 0.27 tC:

Total Project Estimated Carbon saving over:	tC /yr	tC /25yr
Overall 'grid' mix generation	265	6,600
Fossil fuel mix generation	375	9,400

**Table 13.3 – Calculated CO<sub>2</sub> emission savings**

<sup>17</sup> Digest of UK Energy Statistics 2013 (DUKES) Table 6.5 - Load factors for renewable electricity generation, November 2013

<sup>18</sup>

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/244732/1\\_regional\\_renewables\\_2012.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244732/1_regional_renewables_2012.pdf)

<sup>19</sup> <http://www.scotland.gov.uk/Resource/Doc/917/0120448.pdf>

### Projected carbon savings and costs

The potential carbon savings and carbon costs associated with wind farm development are as follows:

- Carbon emission savings (based on emissions from different power sources);
- Loss of carbon due to production, transportation, erection, operation and decommissioning of the wind farm;
- Loss of carbon from backup power generation;
- Loss of carbon-fixing potential of peatland;
- Loss and/or saving of carbon stored in peatland (by peat removal or changes in drainage);
- Carbon saving due to improvement of habitat; and
- Loss and/or saving of carbon-fixing potential as a result of forestry clearance.

An assessment of the Bairds Malt turbine against each of these elements is presented below.

### Production, transportation, erection, operation and decommissioning of the wind farm

In the absence of a specific life cycle assessment for the turbine, the SNH Technical Guidance Review recommends using the following equations:

For turbines <1MW:  $L_{life} = (517.62 * C_{turbine}) - 0.1788$

For turbines >1MW:  $L_{life} = (934.35 * C_{turbine}) - 467.55$

Where  $C_{turbine}$  is the capacity of each machine.

Using this formula, the lifecycle CO<sub>2</sub> emissions of the turbine can be estimated to be **466 tonnes** which corresponds to a payback time of around **6.3 months** against the grid mix generation. This corresponds to **126 tonnes** of carbon.

### Requirement for backup power generation

The SNH Technical Guidance Review states that the extra capacity required for backup power generation is estimated to be 5%, if wind energy contributes more than 20% to the national grid.

The guidelines estimate that the contribution of wind power to the national grid will not exceed 20% until 2038. The Bairds Malt turbine is scheduled for build in 2015 and is intended to be decommissioned after the 25 year operational life in 2040. Therefore no additional CO<sub>2</sub> loss from back up generation requirements can be attributed to the project over the first 23 years of operation, however over the latter 2 years the 5% additional CO<sub>2</sub> loss will apply.

Backup power generation is assumed to be by fossil-fuel mix of electricity generation. The additional CO<sub>2</sub> loss is calculated using the following equation:



CO <sub>2</sub> Emissions (Backup Generation)	=	Rated Capacity [MW/yr]
		x
		Backup Capacity Required [%]
		x
		Additional emissions due to reduced thermal efficiency of reserve generation [%]
		x
		Grid mix of electricity generation [TCO <sub>2</sub> /yr]
		x
		Lifetime of project (years)

At the proposed wind farm site the CO<sub>2</sub> emissions associated with the requirement for extra backup generation over the latter years of operation is calculated as a loss of **~34 tonnes of CO<sub>2</sub>**.

### Peat

No areas of peat will be affected by the proposal, either through direct impacts or indirectly through impact upon drainage.

### Forestry

No areas of forestry are expected to be cleared as a result of the proposal.

### Results

The following table summarises the overall carbon balance of the development over its 25 year lifecycle, based upon the overall grid mix counterfactual, which represents a conservative estimate.

**Table 13.3– Predicted carbon savings / losses**

Element:	Predicted lifetime savings / losses (tC)
Projected carbon savings compared to grid mix	-6,636
Production, transportation, erection, operation and decommissioning	+126
Requirement for backup power generation	+34
Peat losses / savings	0
Forestry losses / savings	0
<b>Total</b>	<b>-6,476</b>

**Table 13.3** shows that over its 25 year lifecycle the project is expected to result in a carbon saving of **~6,500 tonnes**.

### Other Polluting Gas Emissions Savings

Other gas emissions resulting for fossil fuel sourced electricity generation are sulphur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>x</sub>), both responsible for acid rains. Emissions savings relating to the project can be calculated using the BWEA guidance. This suggests that the

SO<sub>2</sub> and NO<sub>x</sub> emissions savings are, respectively, 10 and 3 kg per MWh. This translates to emissions factors of 0.01 and 0.003 [tonnes/MWh] respectively.

<b>Project total emission savings of:</b>	
Sulphur dioxide SO <sub>2</sub>	~572 tonnes /25yr
Nitrogen dioxide NO <sub>x</sub>	~171 tonnes /25yr

### **13.5 Mitigation**

As the development as a whole is expected to have a small beneficial effect on climate change in terms of offsetting greenhouse gas emissions, no mitigating actions are suggested.

### **13.6 Conclusions**

It is concluded from the above that the development would have an overall modest positive effect in reducing UK greenhouse gas emissions.

The wind turbine will offset the electricity import requirement of the plant, and will provide a source of green energy that helps to lower the business' carbon footprint.

### **13.7 References**

Department of Energy and Climate Change (2013), *Regional and local authority electricity consumption statistics: 2005 to 2013*.

The Scottish Government (2013), *Energy Statistics Summary*, The Scottish Government.

The Scottish Government (2009), *Climate Change (Scotland) Act 2009*, The Scottish Government.

The Scottish Government (2013), *2020 Routemap for Renewable Energy in Scotland - Update*, The Scottish Government.

UK Government (2008), *Climate Change Act 2008*, UK Government.

## 14 Safety

### 14.1 Introduction

This chapter describes the potential health and safety issues relating to the operation of the proposed turbine. The paragraphs below outline the procedures that will be put in place and followed to ensure the safety of the workforce and the public, specifically in relation to the following:

- Approach to safe operation and maintenance;
- Turbine safety;
- Safe operation;
- Safety during adverse weather conditions; and
- Public safety.

### 14.2 Legislation and Standards

The construction of the turbine must comply with the requirements of the Construction (Design and Management) Regulations 2007. These regulations oblige the developer to notify the Health and Safety Executive (HSE) of the project, and to establish a safety management system encompassing risk assessment, design measures and management instructions to ensure the safety of construction (and operational) staff and the public. Best practice health and safety guidelines published by Renewable UK (2010), will be adhered to and speed limits will be put in place to regulate traffic flows.

SNH have also provided a Good Practice Guide to good practice in wind farm construction:

<http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/good-practice-during-windfarm-const/>.

### 14.3 General Approach to Safe Operation and Maintenance

As for any mechanical or electrical installation, wind farms could pose a safety risk if not managed and maintained correctly. The Construction (Design and Management) Regulations 2007 (CDM) are now well established as the key legislation that is applicable to the development and construction of onshore and offshore renewable energy projects within the jurisdiction of Great Britain. It is important to comply with this legislation to avoid enforcement action and possible prosecution.

Detailed risk analysis and avoidance limitation measures are required for every facet of the development and operation of a wind project. These measures would be contained in the Health and Safety file for the proposed Bairds site, which would be open to inspection by the Health and Safety Executive. All site personnel would have full safety training, to ensure risk of accidents occurring is minimised.

Safety of the public and contractors are of paramount importance to Kilmac Energy. During construction and subsequent operation of the development, site safety procedures will be strictly enforced and followed.

## **14.4 Assessment of Predicted Impacts and Effects**

### **14.4.1 Best Practice Guidelines for Wind Energy Health and Safety**

During the construction, decommissioning and operational phase of the projects relevant guidance, legislation and standards as well as 'good and best practices' will be adopted to maintain site safety.

All personnel working on the site would undergo an induction covering topics including health and safety, environmental protection and pollution prevention, control and response.

A Construction Method Statement (CMS) would be developed to ensure a coordinated approach. This plan would highlight the health, safety and environmental considerations related to the proposed works and define the controls to be implemented to ensure a safe system of work.

### **14.4.2 Turbine Safety**

The selected Enercon E44 wind turbine model has full certification from a recognised authority against internationally recognised standards, and a proven track record of safe operation. The main certification agencies, have well developed and proven certification procedures. A mature suite of safety and testing standards developed over many years by the International Electrotechnical Commission are now in place and are widely accepted. Working in parallel, these standards and certification procedures have ensured that wind turbines adhering to them have high levels of intrinsic safety.

As stated in PAN 45: *"Many blades are composite structures with no bolts or other separate components. Even for blades with separate control surfaces on or comprising the tips of the blade, separation is most unlikely"* (Para 48, SEDD, 2002). Although PAN 45 has now been revised and updated this advice remains relevant. The highest risk of damage is in extreme wind speed conditions (>100mph) when the likelihood of anyone being on site is remote. Even under these conditions the risk of damage is small (for example, the Wigton wind farm in Jamaica which RES constructed and commissioned in 2004 did not incur any significant damage by Hurricane Ivan which caused devastation throughout the island on 10<sup>th</sup> September later that year). The turbines proposed for the site would be certified to withstand appropriately extreme conditions.

### **14.4.3 Safe Operation**

Modern wind turbines incorporate sophisticated supervisory control systems that continually interrogate the operational status and safe working of key components of each turbine and allow an operator to remotely monitor the turbines via satellite link. Under fault conditions, affected turbines automatically shut down and send an alarm to the maintenance engineer. For safety-critical faults, turbines do not re-start until the maintenance engineer has diagnosed and rectified the problem.

In terms of general safety during operation, the turbines would be supported by the manufacturer's operational and maintenance safety manuals, which would be available on

site. These manuals would form the basis of the regular safety checks that would be undertaken throughout the life of the development.

The operator of the turbine, in compliance with relevant safety regulations, would display appropriate warning signs concerning restricted areas on the turbines, sub-station enclosure and control building. Authorised personnel and persons under their supervision who visit the restricted areas of the site during its operation would operate under site-specific safety rules established by the owner and operator. Electrical installation conducted in accordance with standards and recognised codes of practice, with adequate signage and protection.

#### **14.4.4 Public Safety**

After construction is completed, there would be no reason under normal circumstances to restrict access to the Core Path and fields to the east of the turbine.

As for any structure, storm damage to turbines can be sustained during severe storm events. A few isolated cases of turbine blade or other damage have occurred in exceptionally high wind conditions.

The plant, equipment and their enclosures are designed to incorporate the best available technology and access to the proposed wind project site should pose no danger to the public. During routine maintenance operations 'warning' signs would be erected. At the main entrance to the site, signs would be deployed giving basic safety information, including speed limits, appropriate personal protective equipment and also giving details of whom to contact in an emergency. Emergency contact information would also be posted at the local police station and with the local power distribution company, SSE.

#### **14.4.5 Safety During Adverse Weather Conditions**

Although the possibility of attracting lightning strikes applies to all tall structures, wind turbines have specific protection requirements due to their size and nature. Specific design features are required to ensure safety and to ensure that the turbines can operate during lightning storms without damage and without impact on reliability. Specific features are incorporated into the blades to ensure strikes are conducted harmlessly past the sensitive parts of the nacelle and down the tower into the earth. Protection also includes a buried earthing mat around each turbine foundation and/or a deeply sunk lightning conduction cable which is sunk to a substantial depth into the earth, sufficient to ensure appropriate conduction to ground.

In some countries, icing of wind turbine blades presents a potential risk that must be managed. In the more temperate climates of the UK, icing has not been a major problem to date, but at higher elevations and at locations further north, the risk will be greater and needs to be suitably assessed.

Generally, there is no inherent danger in operating a wind turbine at low temperatures, and there is no particular risk simply because it is frosty or snowing. However, under certain atmospheric conditions, such as freezing-fog which specifically involve low temperatures and high humidity, hard ice can form on the blades (this can also happen either when rain freezes on contact with a blade or should the turbine be operating in low cloud). The

Enercon turbine proposed at the site has an ice detection system which will shut down the turbine if a build-up of ice is detected; thus reducing the risk of ice throw.

In order to further minimise the risk of falling ice (i.e. ice falling off stationary blades and being blown by the wind) an ultrasonic anemometer can be mounted on the turbine to further reduce this risk.

#### **14.5 Summary of Predicted Impacts and Effects**

Wind turbines have a proven track record for safety, and the Enercon turbine proposed for Bairds Malt will be constructed and operated in accordance with relevant health and safety legislation. Commercial sized turbines are particularly reliable, requiring minimal intervention and maintenance during operation. They are designed to cope with extreme wind and weather conditions.

Only turbines with a proven record of safety and reliability will be selected for this site. The risk of ice throw (ice falling or being thrown from a turbine during particular circumstances) is also low. An ice detection system on the turbines will ensure they are deactivated if there is a risk of ice throw.

#### **14.6 References**

- 1) RenewableUK (2010), Guidelines for onshore and offshore wind farms – Health and Safety in the Wind Energy Industry Sector, RenewableUK, London.
- 2) Scottish Government (2002) *PAN 45 – Renewable Energy Technologies*, Scottish Government (replaced with web based renewables guidance: <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables>).
- 3) Scottish Government (2007), Statutory Instruments, 2007 No. 320, Health and Safety – The Construction (Design and Management) Regulations 2007, Scottish Government.





# **BAIRDS MALT WIND TURBINE**

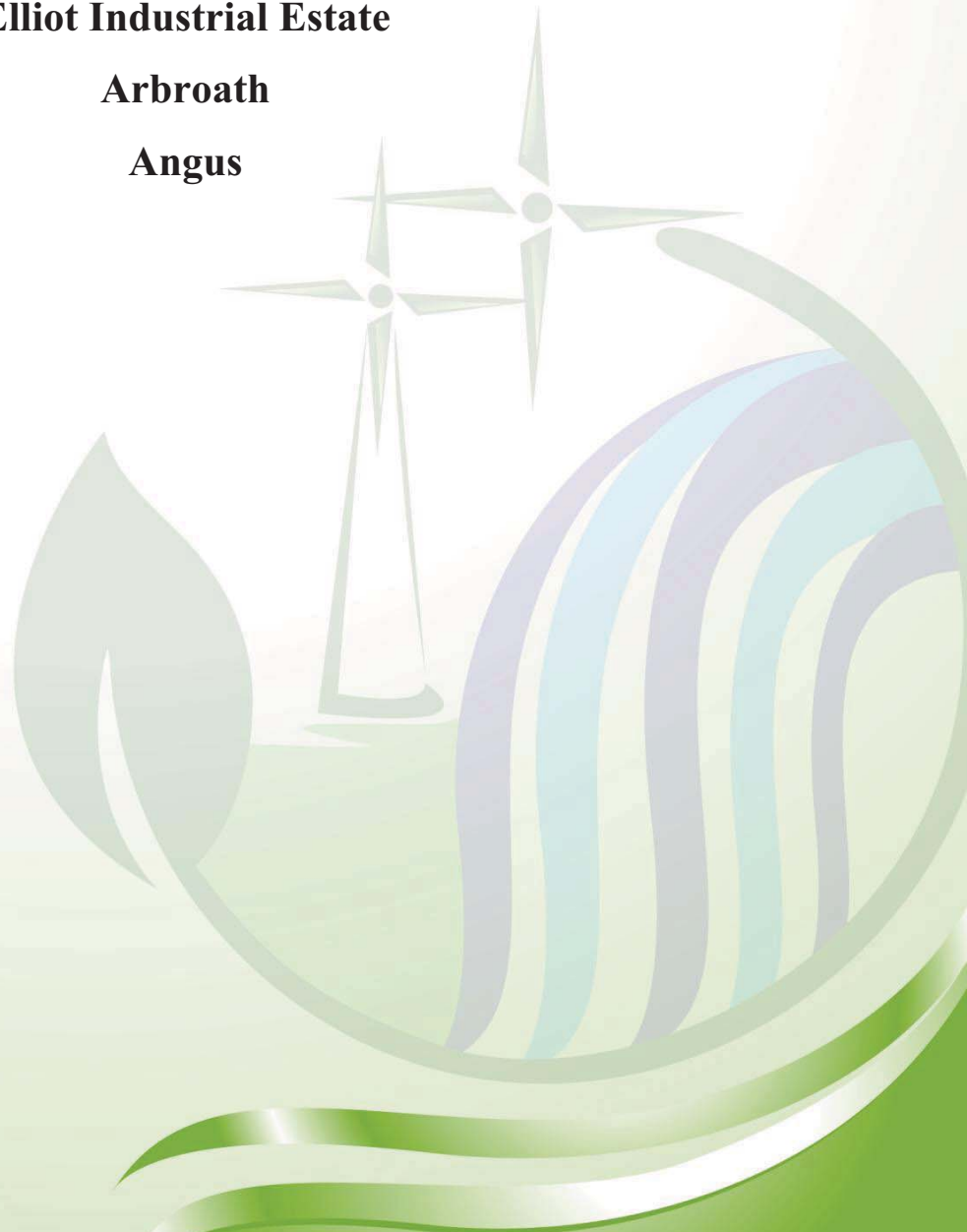
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## **Appendix 1 – Protected Species Report**

**December 2014**

**Protected Species Assessment**

**Bairds Malt Ltd**  
**Elliot Industrial Estate**  
**Arbroath**  
**Angus**



## Executive Summary

GLM Ecology was commissioned by Green Cat Renewables Ltd to undertake an Protected Species Assessment to support and inform a planning application for a single turbine (77m to tip) at Bairds Malt Ltd, Arbroath, Angus. The survey followed standard methodology as published by the Joint Nature Conservation Committee 1988, a technique for Environmental Audit. The survey aimed to assess the ecological value of the site and record any protected habitats.

The purpose of the assessment was to document the baseline ecological conditions of the site. Desktop studies identified any designated sites within specified zones of impact from site boundaries as published by Scottish National Heritage. The potential of the site for protected species of conservation interest that would require further survey on the basis they might comprise an ecological constraint to the proposed development was undertaken using standard methodology.

Designated sites were recorded within 20km of the site, however it is considered that the development would have a negligible impact on the integrity of these sites.

The site walkover revealed the presence of a poor variety of habitats present within the survey area. The site is an industrial malting plant supplying the whisky industry. Predominant habitats to the west are arable fields with industrial estates present in all other directions.

A bat survey following BCT guidelines was carried out and no bats were recorded. The survey area has no potential to support any protected species and species of conservation concern.

It is considered that no further works are likely to be required on any protected species or habitats.

## INTRODUCTION

**1.1** GLM Ecology was commissioned in May 2012 by Green Cat Ltd to carry out a Protected Species Survey to highlight potential ecological constraints and an assessment of the potential for impacts on protected species and habitats at a proposed single turbine (77m to tip) wind site at Bairds Malt Ltd, Arbroath, Angus.

**1.2** The plans indicate that the access track is to pass through the industrial factory complex. The turbine (Figure 1) is to be situated within the complex with some infrastructure located in the arable field adjacent to the site.

**1.3** The assessment aims were as follows:

- To assess the potential ecological constraints to any development of this site;
- To assess the ecological value of such a site;
- To recommend further survey work if required.

**1.4** This baseline exercise has been undertaken in accordance with the ‘Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995) and ‘Guidelines for Ecological Impact Assessment in the UK’ (Institute of Ecology and Environmental Management (IEEM), 2006). This report identifies approaches likely to be required, subject to formal consultation with Scottish Natural Heritage, Local Planning Authorities and other relevant parties.

**1.5** The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 require that before consent is granted for certain types of development, an EIA (which includes an ecological and ornithological assessment) must be undertaken. The *EIA Regulations 2011* set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if they are above certain thresholds and are likely to give rise to significant environmental impacts (Schedule 2).

## 1.6 Legislative context

A number of sites, habitats and species are protected under European and UK legislation, and may present constraints to site development.

Principal legislation and guidance which will be considered are:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) 1992;
- Conservation (Natural Habitat &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004;
- Protection of Badgers Act 1992;
- Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, 2013;
- Avoidance rates for wintering species of geese in Scotland at onshore wind farms SNH 2013.
- Siting and Designing Wind Farms in the Landscape, SNH 2009;
- Assessing the impact of small-scale wind energy proposals on the natural heritage, SNH 2011;
- Assessing connectivity with Special Protection Areas (SPAs), SNH 2012;

1.7 Species that are protected include bats, badgers, otters, water voles, red squirrels and great crested newts. Protected sites and habitats include Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) and Special Areas of Conservation (SAC).

## 1.8 Zone for consideration for ecological features

The zone of sensitivity for ecological features varies, depending on the nature and behaviour of the habitat or species, and also the type of impact that may affect them. As a general rule in this assessment, the impacts on individual habitats or species are considered for the whole of the development area, plus the following additional distances where appropriate as indicated in the guidelines by SNH <sup>1</sup>.

**Table 1: Zone of Impact from Site Boundary of Ecological Features**

<b>Ecological feature</b>	<b>Zone of impact from site boundary</b>
Internationally designated sites (SPA, Ramsar)	Within 20km
Nationally designated sites (SSSI, NNR)	Within 5km
Locally designated sites (LNR, WS)	Within 1km
Badgers and red squirrels	Within 500m
Bats	Within 500m
Birds	Within 500m

## **METHODOLOGY**

### **1.9 Data Study**

A data search was carried out using Magic Map to identify any designated ecological sites within 20km radius of the site.

**1.10** A short desktop study was carried out via the following resources to identify the presence of any protected species present within the 10km grid square encompassing the survey site.

- NBN Gateway<sup>2</sup>
- RSPB sensitivity maps<sup>3</sup>;
- Scottish Natural Heritage (SNH) Sitelink<sup>4</sup>;
- Scottish Raptor Group<sup>5</sup>;
- Multi Agency Geographic Information for The Countryside<sup>6</sup>

### **1.11 Field Survey**

A field survey was carried out in May 2012 in good weather conditions.

## RESULTS

### 1.12 Ecological Sites within 20km of Site

Ecological feature	Zone of impact from site boundary	Sites
Internationally designated sites (SPA, SAC, Ramsar)	Within 20km	Montrose SPA – designated for non-breeding assemblage of waterfowl and pink-footed goose. Firth of Tay and Eden Estuary SPA - designated for non-breeding assemblage of waterfowl and pink-footed goose.
Nationally designated sites (SSSI, NNR)	Within 5km	Elliot Links SSSI– Designated for sand dunes.
Locally designated sites (LNR, WS)	Within 1km	None

### 1.13 Data Search Protected Species

Within a 10km square encompassing the survey area the following were recorded via National Biodiversity Network;

- Daubentons bat *Myotis daubentoni*
- Badger *Meles meles*
- Otter *Lutra lutra*
- Red squirrel *Sciurus vulgaris*



### 1.14 Site Description

The site at Bairds Malt (see Figure 1) is situated on Elliot Industrial Estate Arbroath. The site is a working malt factory and is totally industrialised. The single turbine is proposed to be situated in the west of the complex (Figures 2, 3). The factory is surrounded on three sides by other industrial units. To the west of the factory open fields are present (Figure 4, 5).



**Figure 2. Bairds Malt Complex**



**Figures 3 & 4. Area near turbine location**





**Figures 5 & 6. Habitat to west of factory.**

### 1.15 Discussion

The site is a working industrial complex. No running water is present on site or near the proposed construction footprint. From an ornithological viewpoint the following protected bird species are considered to be important in the general context of wind farm construction and operations.

- Schedule 1 Raptors
- Birds of Conservation Concern
- Wintering and Migratory Waterfowl
- Any other species considered important on a local, national or international scale.

Given the small size of the site, its industrial habitat, lack of suitable breeding and foraging habitat for birds it is considered that the proposed construction of a single turbine would have a negligible significance of impact on any breeding, migratory or over wintering species.

### 1.16 Protected Mammals

No suitable habitat exists on site for any protected flora, mammals, amphibians or reptiles.

### 1.17 Bats

Bats of all species in Britain and their roosts are protected under the Conservation (Natural Habitats, &c) Amendment (Scotland) Regulations 2007. Following recent changes to legislation in Scotland under this law it is illegal intentionally or recklessly to kill or injure a bat, to disturb a roosting bat or to damage, destroy or obstruct access to any bat roost. This applies to both summer and winter roosts, which may be in different structures. Any action, which is likely to disturb or damage a bat roost, requires a license from the Scottish Executive.

### **1.18 Aims & Objectives**

To determine what bat species are present on the site and whether the habitat is utilized for roosting, foraging or commuting by bats.

### **1.19 Survey Methodology**

A habitat and bat assessment survey was carried out at the site in May 2012 in accordance with guidance from the Bat Conservation Trust<sup>7</sup> and Natural England<sup>8</sup>. The objectives of the bat surveys were to identify whether the site would be considered suitable for roosting bats and whether bats were present on site. The aim was to provide sufficient evidence so that the potential impacts of the proposed development on any local bat populations could be assessed and if appropriate, mitigation suggested.

### **1.20 Habitat Survey**

A daytime field survey was carried out in May 2012. The site was surveyed for potential flight lines/commuting routes, roosts and foraging areas and the habitat assessed for its overall suitability for bats. Any potential foraging areas were examined and linear features were assessed for their suitability as flight lines or commuting pathways.

### **1.21 Bat Detector Surveys**

A visit was made in May 2012 in good weather conditions. The dusk survey was carried out from approximately 30mins before sunset to 2.0hrs after sunset. The dawn survey was from approximately two hours before sunrise to 30mins after sunrise. The transect was focused on the proposed turbine location with strategic stopping points along the perimeter fencing and small trees adjacent to the turbine location. Bats were surveyed at all times and at stopping points using Bat Box ultrasound bat detectors in conjunction with a mini-disc inline recorder between 20 - 120 MHz. Any potential bat calls on the mini discs were analysed using the Bat Sound software package and identified to species level.

**1.22** A SM2 static bat recorded was positioned for five nights adjacent to where the turbine location is proposed.

### **1.23 Results**

No bats were recorded on either the bat detector survey or on the static bat recorder.

## **DISCUSSION**

**1.24** The purpose of the surveys was to gain an understanding of the potential ecological issues that may arise during any development at the site. The survey comprised a walkover of the site to evaluate the likely presence of protected species and or habitats. Specific searching was also carried out for protected species and an evaluation of the potential habitat was assessed.

**1.25** The site is an industrial complex with arable fields to the west.

**1.26** Survey work was completed across the Site and the immediately surrounding area, following best practice and industry guidance to identify the species and habitats present.

**1.27** A comprehensive desktop study was carried out.

**1.28** No suitable breeding or foraging habitat exists for badger, otter, water vole or protected bird species.

**1.29** Bat surveys were carried out following BCT guidelines and no bats were recorded.

**1.30** It is considered unlikely that the Development will have any long-term impact on the integrity of the area's ornithological features or the conservation status of the species found here.

**1.31** It is considered unlikely that the Development will have any long-term impact on the integrity of the area's protected species, flora and fauna or the conservation status of the species found here.



**1.32** It is also considered that the integrity of qualifying species and habitats for designated sites (Montrose and Firth of Tay SPAs and Elliot Links SSSI) within the specified distances as recommended by SNH would not be impacted upon.

## CONCLUSION

**1.33** It is proposed to construct one wind turbine and associated infrastructure on an industrial complex situated at Bairds Malt, Arbroath, Angus. A range of ecological assessments have been undertaken to investigate the ornithological and other ecological interests of the site and it is concluded that potential for this to be adversely affected by the current proposal is extremely unlikely.

**1.34** It is also considered that the development would have no adverse impact on the integrity of qualifying species for any designated sites within the accepted zone of impact from site boundary.

## REFERENCES

1. Assessing connectivity with Special Protection Areas (SPAs), SNH 2012;
2. National Biodiversity Gateway Database: <http://data.nbn.org.uk/>
3. J. A. Bright et.al. 2006. Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland. RSPB Research Report No 20.  
[http://www.rspb.org.uk/Images/sensitivymapreport\\_tcm9-157990.pdf](http://www.rspb.org.uk/Images/sensitivymapreport_tcm9-157990.pdf)
4. SNH Sitelink: <http://gateway.snh.gov.uk/sitelink/>
5. <http://www.scottishraptorgroups.org/>
6. Multi Agency Geographic Information for The Countryside:  
<http://www.magic.gov.uk/website/magic/>
7. Bat Conservation Trust (2007). Bat Surveys – Good Practice Guidelines. Bat Conservation Trust, London.
8. Natural England Technical Information Note TIN051. (2009) Bats and onshore wind turbines: Interim Guidance.



## DISCLAIMER

This report has been prepared by Dr Garry Mortimer of GLM Ecology, with all reasonable skill and care within the terms of the agreement with the client. Dr Mortimer disclaims any responsibility to any parties in respect of matters outside this scope.

Best efforts were made to meet the objectives of this study through desktop study and field survey.

Information supplied by the client or any other parties and used in this report is assumed to be correct and GLM Ecology accepts no responsibility for inaccuracies in the data supplied.

It should be noted, that whilst every endeavour is made to meet the client's brief, no site investigation can guarantee absolute assessment or prediction of the natural environment. Numerous species are extremely mobile or only evident at certain times of year and habitats are subject to seasonal and temporal change.

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# **BAIRDS MALT WIND TURBINE**

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## **Appendix 2.1 – Viewpoint Assessment**

**December 2014**

<b>Figure 7.13</b>	<b>Viewpoint 1: Queens Drive Arbroath</b>	
Description	<p>The viewpoint is located on the waterfront just off Queens Drive in Arbroath at <b>E363270 N740128</b>. The view faces west towards the proposed development and is situated 1.4km from the turbine. This is a fairly open vista with long distance views occurring over the shoreline to the left hand side of the view. The foreground landscape is predominantly flat, forming the transition between the nearby coastline and the land. The sea wall forms a physical barrier between the two landscapes. The landscape rises over the middle ground with the embankment containing the nearby A92 as it makes its way southwards from Arbroath. The middle ground contains several large industrial buildings including the Maltings. Bands of mature shelterbelt woodland line the horizon limiting potential views over the countryside which covers much of the landscape to the west of the settlement. There are a number of vertical features within the view including street lighting, walls and fencing, the industrial buildings and the children's play park all appear in the view. The viewpoint has been heavily modified over time as Arbroath has expanded the man-made feel of the area has increased significantly.</p>	
Sensitivity	<p>The viewpoint is taken from the coastline near Queens Drive Arbroath and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 1.4km from the proposed development.</p> <p>From this location the proposed turbine would be an obvious vertical feature within the view. The turbine would be viewed on the horizon, backdropped solely by the sky. The maltings buildings and the surrounding woodland provide some screening of the lower sections of the turbine tower. The turbine while an obvious vertical feature would appear in the view alongside a number of other features including street lighting and other street furniture which runs the length of the view, communication masts and the towers at the maltings. The turbine would occupy a medium extent of the vertical view and a low extent of the horizontal view, despite being an obvious feature the turbine would not dominate the views from this location.</p> <p>Overall the magnitude of change is considered to be medium, resulting in a <b>major/moderate</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>The Cuthlie turbine appears theoretically visible to the right of the view. The single turbine is partially screened by the intervening landscape, while the vegetation on the horizon would screen the visible portion of the turbine completely from this location.</p> <p>The cumulative magnitude of change for consented projects would become <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are theoretical views of a handful of planning developments from this location, the single turbines of Upper Balmachie and Montquhir appearing in the same general view as the propose Bairds Malt turbine. The turbines would in reality be screened by the surrounding areas of.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a medium magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Medium</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Major/Moderate</b>

<b>Figure 7.14</b>	<b>Viewpoint 2: Elliot Bridge</b>	
Description	<p>The viewpoint is located on the waterfront just off the A92 as it enters Arbroath next to a small cluster of properties known as Elliot Bridge at <b>E362001 N739451</b>. The view faces north-west towards the proposed development and is situated ~700m from the turbine.</p> <p>The view is fairly enclosed from this location. The minor road which serves as access for the nearby properties runs through the foreground of the view. A stone wall bounds the roadside area separating it from the landscape beyond. The middle ground comprises an area of woodland to the left of the view, associated with the nearby Elliot water as it flows towards the sea, while the middle of the view overlooks the nearby caravan park. To the right views are restricted by the nearby properties which sit on the opposite side of the road. The landscape over the middle ground rises with the formation of lip that encloses the view, alongside the woodland and other built features contained within the vista. The maltings are partially visible on the horizon. The view is made of predominately man-made features with natural features limited to the woodland and vegetation contained to the left of the view.</p>	
Sensitivity	<p>The viewpoint is taken from the access road to some of the closest residential receptors and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 700m from the proposed development.</p> <p>From this location the turbine would be viewed on the horizon, alongside the maltings. The turbine would be an obvious and easily discernible change to the baseline features of the view, appearing solely against the sky. The rise in topography and the surrounding vegetation would screen the lower tower sections from view which would reduce the vertical extents of the development slightly. The turbine would occupy a medium extent of the horizontal view and a high extent of the vertical view becoming the tallest structure in the view.</p> <p>Overall the magnitude of change is considered to be high, resulting in a <b>major</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are theoretical cumulative views with the Montquhir and Crofts Farm turbines from this location, in reality the dense woodland which surround the area would completely screen any potential views towards these developments.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a high magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>High</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Major</b>

<b>Figure 7.15</b>	<b>Viewpoint 3: Arbirlot Road West</b>	
Description	<p>The viewpoint is located at the side of Arbirlot Road West which runs along western edge of Arbroath at <b>E362203 N741066</b>. The view faces south-west towards the proposed development and is situated ~1km from the turbine.</p> <p>The view feels fairly open from this location, the sense of openness coming from the large, flat arable field that dominates the foreground of the view. Long distance views are quickly limited by the nearby built environment comprising the nearby housing estate and the Maltings, which tends to dominate the horizon. The field is bound with a post-and-wire fence as well as clusters of trees to the rear of some of the properties and a band of shelterbelt trees to the left of the view. The scene is fairly urban with the properties and the Maltings providing the key features in the vista.</p>	
Sensitivity	<p>The viewpoint is taken from the western edge of the settlement of Arbroath and represents local residents and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 1km from the proposed development.</p> <p>From this location the turbine would be viewed on the horizon amongst the industrial buildings of the Maltings. The turbine would be partially screened from view by the drying towers, with the visible portion of the turbine viewed solely against the sky. The proposed development would be a fairly obvious feature in the view rising above the existing vertical features; however, it would add another industrial feature to a view which already contains several industrialised components as well as a host of other built features.</p> <p>Overall the magnitude of change is considered to be medium, resulting in a <u>major/moderate</u> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are theoretical views of the Cuthlie and Kenly Farm turbines, the intervening housing estate will screen any potential views. The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are also theoretical successive views with the Crofts Farm turbines, although in reality these developments would be screened by intervening woodland.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a medium magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Medium</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<i>Major/Moderate</i>

<b>Figure 7.16</b>	<b>Viewpoint 4: Boulzie Hill</b>	
Description	<p>The viewpoint is located at the summit of Boulzie Hill which is the most prominent location within the settlement of Arbroath at <b>E364569 N740924</b>. The view faces south-west towards the proposed development and is situated ~2.8km from the turbine.</p> <p>The elevated position of the viewpoint offers open long distance views over the surrounding settlement particularly to the west and south, with the views to the north restricted by properties and other built features of a similar elevation to the hilltop. The view is dominated by the settlement of Arbroath stretching all the way to the horizon, to the south there are more open views over the nearby coastline, with views possible out to sea and on clear days towards Fife. Views over the surrounding countryside are possible beyond the built environment of the settlement although the view is primarily characterised by the urban nature of the settlement. The settlement pattern of the older areas of Arbroath is visible, with the narrow streets around the old centre the dominant feature. Arbroath Abbey and the nearby Kelly Castle appear slightly more prominently in the view elevated from the surrounding buildings. The view represents one of the most open areas within the settlement of Arbroath.</p>	
Sensitivity	<p>The viewpoint is taken from one of the most open and prominent locations within Arbroath and represents local residents and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 2.8km from the proposed development.</p> <p>From this location the turbine would be viewed on the horizon amongst the industrial buildings of the Maltings. The turbine would be partially screened from view by the drying towers, with the visible portion of the turbine viewed solely against the sky. The proposed development would be a fairly obvious feature in the view rising above the existing vertical features; however, it would add another industrial feature to a view which already contains several industrialised components as well as a host of other built features.</p> <p>Overall the magnitude of change is considered to be medium, resulting in a <b>major/moderate</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are theoretical views of a small number of consented developments from this location with the turbines of Cuthlie, Stotfaulds and Cruivie Farm all appearing theoretically visible in the same general view as the Bairds Malt turbine from this location. The Cuthlie turbine would be the most prominent of these developments and would appear on the distant horizon, the other developments would likely be screened by other features in the wider view.</p> <p>The cumulative magnitude of change for consented projects would become <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>As well as the consented turbines there are theoretical views of a small number of planning developments such as Montquhir and Upper Balmachie appearing theoretically visible in the same general view as the Bairds Malt turbine from this location. The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a medium magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Medium</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Major/Moderate</b>

<b>Figure 7.17</b>	<b>Viewpoint 5: Bearfauld Road</b>	
Description	<p>The viewpoint is located at the side of Bearfauld Road, part of the National Cycle Network to the north-east of Arbroath at <b>E365244 N742573</b>. The view faces south-west towards the proposed development and is situated ~4.2km from the turbine.</p> <p>The view feels very open from this location, offering long distance views from the elevated position overlooking the nearby settlement of Arbroath, towards the coast and over the wider arable landscape which forms much of the Dipslope farmland. The landscape rolls away gently from the viewer, land cover over the foreground is dominated by a large arable field. The settlement of Arbroath sits within the landscape below, the topography rolling away to the nearby coastline. A dense band of mature woodland lines the middle ground screening views of the nearby A92. Beyond this the landscape rises, forming a gently rolling horizon that limits further views. This landscape is fairly typical of the wider rural area, with large rectilinear fields and clusters of woodland around the summits.</p>	
Sensitivity	<p>The viewpoint is taken from the side of Bearfauld Road, which forms part of the National Cycle network to the north-east of Arbroath and represents road users, cyclists and local residents and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 4.2km from the proposed development.</p> <p>From this location the proposed turbines would be viewed breaking the horizon, with the majority of the turbine tower viewed against the landscape, the upper tower section, hub and blades would be viewed against the sky. The turbine would occupy a low extent of the vertical and horizontal view from this location, sited away from the nearby summits the turbine would not dominate or control this view.</p> <p>Overall the magnitude of change is considered to be low, resulting in a <b>moderate</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are theoretical long distance views towards the Ark Hill windfarm although the intervening landscape would screen the majority of the development from view and located over 20km from the viewer it is unlikely to be an easily discernible feature within this view.</p> <p>The cumulative magnitude of change for operational projects would be <b>negligible</b>.</p> <p><u>Operational, Consented</u></p> <p>Frawney and Govals similar to the Ark Hill turbines appear on the distant horizon to the right of the view. The landscape screening all but the blade tips of the development from this location. The Cuthlie turbine is more prominent in the same view direction, sitting on the horizon the single turbine is viewed against the sky.</p> <p>The cumulative magnitude of change for consented projects would remain <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are theoretical views of the single turbine at Upper Balmachie and Montquhir, the single turbines appearing predominantly against the landscape from this location. It is unlikely that they will be prominent or discernible features within the open view from this location.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a low magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Low</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	<b>Level of Effect:</b>	<b><i>Moderate</i></b>



<b>Figure 7.18</b>	<b>Viewpoint 6: East Haven</b>	
Description	<p>The viewpoint is located at the side of a minor road by East Haven, part of the National Cycle Network to the south-west of Arbroath at <b>E358631 N736475</b>. The view faces north-east towards the proposed development and is situated ~4.8km from the turbine.</p> <p>The view feels fairly open from this location. The landscape is fairly flat over the foreground, rising slightly but not sufficiently to limit long distance views towards the rolling hills to the north-west of Arbroath. The land cover across the foreground is dominated by a series of large fields, used for grazing and arable farming; a drystone wall runs through the view marking the field boundary. The horizon is broken with two bands of distinct shelterbelt woodland, which frames the centre of the view. To the far right of the view glimpses towards the coast are also possible adding to the open nature of the vista. The view contains a number of man-made features including the nearby farm buildings and a communication mast which sits amongst the trees to the left of the view. The view is pleasant; containing a significant number of man-made features it does not feel particularly remote and typical of the wider farming landscape of the area.</p>	
Sensitivity	<p>The viewpoint is taken from the side of a local minor road near to East Haven, which forms part of the National Cycle network and represents road users, cyclists and local residents and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 4.8km from the proposed development.</p> <p>From this location the proposed turbine would be viewed breaking the horizon, partially backdropped by the distant upland landscape. The turbine would not be an overly prominent feature in the view over this distance, appearing alongside several more prominent vertical features in the nearby woodland and the communication mast. The turbine would occupy a low extent of the horizontal and vertical view.</p> <p>Overall the magnitude of change is considered to be low, resulting in a <b>moderate</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are no planned developments visible from this location.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a low magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Low</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Moderate</b>

<b>Figure 7.19</b>	<b>Viewpoint 7: A92, Salmonds Muir</b>	
Description	<p>The viewpoint is located at the side of the A92 to the south of Arbroath at <b>E358388 N737974</b>. The view faces north-east towards the proposed development and is situated ~4.0km from the turbine.</p> <p>The view is very open from this location. The foreground remains almost uniformly flat, overlooking the surrounding farmland the land cover is dominated by a mixture of large predominantly arable fields. These fields are bound by post-and-wire fencing, hedgerows and the occasional area of shelterbelt woodland. The A92 runs through the middle of the scene although the road itself is not particularly visible the road furniture signs and other features are visible in the view. To the right of the view the landscape ends abruptly at the horizon with views towards the sea possible, adding to the openness of the vista. Woodland is a more prominent feature inland over the middle ground towards the settlement of Arbroath, limiting views of the settlement itself. The view is fairly modified with a number of man-made elements present within the wider view from farming infrastructure to the road network and associated features.</p>	
Sensitivity	<p>The viewpoint is taken from the side of the A92 and represents road users and is therefore considered to be of <b>Medium</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 4.0km from the proposed development.</p> <p>From this location the proposed turbine would be viewed breaking the horizon, with the tower predominantly viewed against the landscape, the hub and blades would be viewed against the sky. The turbine would not be an overly prominent feature within this open and fairly large scale vista, appearing less prominent than some of the nearby road paraphernalia.</p> <p>Overall the magnitude of change is considered to be low, resulting in a <b>moderate/minor</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are no planned developments visible from this location.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a low magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>Medium</i>
	Magnitude:	<i>Low</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Moderate/Minor</b>

<b>Figure 7.20</b>	<b>Viewpoint 8: Patrick Allan Fraser Street</b>	
Description	<p>The viewpoint is located on Patrick Allan Fraser Street within the housing estate adjacent to the Maltings at <b>E361793 N740492</b>. The view faces south towards the proposed development and is situated ~420m from the turbine.</p> <p>The view is very enclosed from this location. A row of properties is located on the opposite side of the street from the viewer, these dwellings limit views beyond. To the rear of these properties a band of mature trees form a barrier between the rear garden areas and the nearby Maltings which can be seen rising above the tree line, the elevated walkways between the grains silos an obvious feature within this urban setting. An area of open grassland is located to the right of the view, interspersed with trees.</p>	
Sensitivity	The viewpoint is taken from nearby housing estate and represents the views of some of the closest residential receptors and is therefore considered to be of <b>High</b> sensitivity.	
Magnitude of Change	<p>Receptors of this view would be 420m from the proposed development.</p> <p>From this location the turbine would be an obvious and easily discernible feature in this view. Rising above the nearby tree line and the Maltings infrastructure. The turbine would control part of the view, occupying a high extent of both the horizontal and vertical view.</p> <p>Overall the magnitude of change is considered to be high, resulting in a <b>major</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a high magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>High</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Major</b>

<b>Figure 7.21</b>	<b>Viewpoint 9: Firthfield</b>	
Description	<p>The viewpoint is located at the side of a local minor road to the north-west of Woodville Feus at <b>E359546 N743455</b>. The view faces south-east towards the proposed development and is situated ~4.1km from the turbine.</p> <p>The view feels fairly open from this location. The foreground landscape is dominated by a series of flat arable fields, the local road runs through the foreground of the view disappearing as it rounds a corner to the left of the view. The rear of the view is restricted by a band of roadside woodland which can be seen to the left of the view. A small drystone wall bounds the local road with the neighbouring fields. A band of mature shelterbelt woodland occupies the horizon to the right of the view, while individual trees and hedgerows mark out field boundaries in the centre of the view. Due to the local topography longer distance views occur across the central areas of the vista with views possible towards the nearby coastline, with the sea rising beyond the landscape forming an infinite horizon. The settlement of Arbroath is visible in the distance, interspersed with areas of mature woodland next to the coast. The view does not feel particularly remote, overlooking a heavily man modified landscape with annually changing crop patterns as well as the local settlements, a series of metal electricity pylons traverse the middle ground of the landscape appearing against the sea adding further vertical elements to the view.</p>	
Sensitivity	<p>The viewpoint is taken from a local road to the north of the proposed development; the viewpoint was chosen to represent road users, primarily local residents of neighbouring farms and steadings and is therefore considered to be of <b>High</b> sensitivity.</p>	
Magnitude of Change	<p>Receptors of this view would be 4.1km from the proposed development.</p> <p>From this location the turbine would appear predominantly backdropped by the surrounding landscape and sea. The development would occupy a negligible extent of both the horizontal and vertical view. From this location the turbine would appear in keeping with the other vertical feature present in the view including the nearby electricity pylons, it is not predicted that the turbine will be an overly prominent feature which would not dominate or control or limit longer distance views to the sea.</p> <p>Overall the magnitude of change is considered to be low, resulting in a <b>moderate</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are successive views with the single Cuthlie turbine from this location. The turbine would appear to the right of the viewer on the horizon the turbine would appear solely against the sky in a more enclosed area of the landscape than the Bairds Malt turbine. Located closer to the viewer it would be a more prominent feature in this view.</p> <p>The cumulative magnitude of change for consented projects would become <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>Successive views would also occur with the Crofts Farm turbines, although the intervening vegetation would significantly limit the views of the turbines to the rear of the view.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a low magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Low</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Moderate</b>

<b>Figure 7.22</b>	<b>Viewpoint 10: Braeside</b>	
<p>Description</p> <p>Sensitivity</p>	<p>The viewpoint is located at the side of a local minor road to the west of the proposed development at <b>E359045 N739953</b>. The view faces east towards the proposed development and is situated ~2.8km from the turbine.</p> <p>The view from this location is very open. The landscape rolls away gently from the viewer towards the nearby coastline, offering long distance views out over the sea from this slightly more elevated location. The landscape is made up of a patchwork of large predominantly rectilinear fields, the differing colours strengthening the patchwork effect. Fields are bound by a mixture of drystone walls, hedgerows and post-and-wire fences, with occasional trees and shelterbelts also reinforcing boundary lines. To the left of the view the settlement of Arbroath is visible spreading inland from the coastline. The view overlooks a distinctly modified landscape with the intense agricultural use highlighted by annually changing crop rotations, there are a number of individual properties scattered throughout the vista, primarily farms with isolated rows of cottages. Minor roads cross the area as well as the A92 which is visible over the middle ground between the viewer and the coast. Rows of electricity pylons cross the landscape, predominantly viewed against the landscape from this position.</p> <p>The viewpoint is taken from a local road to the west of the proposed development; the viewpoint was chosen to represent local residents of neighbouring farms and steadings and is therefore considered to be of <b>High</b> sensitivity.</p>	
<p>Magnitude of Change</p>	<p>Receptors of this view would be 2.8km from the proposed development.</p> <p>From this location the proposed turbine would appear predominantly backdropped by the landscape and the nearby sea. Occupying a negligible extent of both the horizontal and vertical view from this location, the turbine appears alongside the Maltings workings and while adding a fairly strong vertical element to the view it occupies the same space as the most prominent industrial element already present in the view. The turbine would not limit or restrict views over the coastline or towards the settlement of Arbroath from this location adding a vertical man-made feature to the view which contains a number of man modified elements.</p> <p>Overall the magnitude of change is considered to be low, resulting in a <b>moderate</b> level of effect.</p>	
<p>Cumulative Impact</p>	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are no planned developments visible from this location.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
<p>Type of Effect</p>	<p>On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a low magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.</p>	
<p>Assessment of Visual Effects</p>	<p>Sensitivity:</p>	<p><i>High</i></p>
	<p>Magnitude:</p>	<p><i>Low</i></p>
	<p>Type of Effect:</p>	<p><i>Permanent, direct and negative</i></p>
	<p>Level of Effect:</p>	<p><b>Moderate</b></p>

<b>Figure 7.23</b>	<b>Viewpoint 11: A933 near Montreathmont</b>	
Description	Viewpoint 11 is taken from <b>E359107 N751263 at the side of the A933</b> .l. The view faces south-east towards the turbine which is located ~11.5km from the viewer.  The view feel relatively enclosed from this location. The A933 forms a prominent man-made feature within the view, running across the centre to the right of the view, disappearing over the middle ground beyond the tree line. The route is bound on the right by a band of mature shelterbelt woodland, while the left of the road, the landscape is relatively flat, with a small number of large rectilinear fields. The field boundaries are marked over the middle ground by a significant band of mature shelterbelt woodland. The shelterbelt also encloses the view, limiting long distance views over the surrounding countryside to the south-east. A large farm and outbuilding are located beyond amongst the woodland in the centre of the vista. The view feels heavily man-made with the predominantly farming landscape, the A933 and the farm the main features in the view.	
Sensitivity	The viewpoint is located at the side of the A933 and was chosen to represent road users, and is therefore considered to be of Medium sensitivity.	
Magnitude of Change	Receptors of this view would be 11.5km from the proposed turbine.  From this location the proposed Bairds Malt turbine is heavily screened by the intervening landscape with only the blade tips of the proposed turbine theoretically visible. Due to the intervening screening of the woodland there would be no views of the proposed turbine from this location.  The overall magnitude of change for the development is considered to be negligible, as the turbine is unlikely to be discernible within the wider landscape from this location, leading to a <b>minor</b> level of effect.	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational developments visible from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>none</b>.</p> <p><u>Operational, Consented</u></p> <p>There are no consented developments visible from this location</p> <p>The cumulative magnitude of change for consented projects would remain <b>none</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are no planned developments visible from this location.</p> <p>The cumulative magnitude of change for planning projects would remain <b>none</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a negligible magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>Medium</i>
	Magnitude:	<i>Negligible</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<i>Minor</i>

<b>Figure 7.24</b>	<b>Viewpoint 12: Dodd Hill</b>	
Description	<p>Viewpoint 12 is taken from <b>E345256 N739618</b>, by the cairn at the summit of Dodd Hill. The view faces east towards the turbines which is located ~16.6km from the viewer.</p> <p>The view is very open from this prominent elevated location. Facing eastwards, the view overlooks the large agricultural plain that makes up much of the intervening landscape, between the Sidlaws and the eastern coast. The landscape slopes gently towards the coast, allowing for views of the sea beyond the landscape, when looking north-east, east and south-east towards Dundee. Inland the view offers a more rural and natural landscape with the foreground consisting of heather moorland and gorse. In the middle ground arable fields and coniferous plantations are the predominant land cover and this continues until the topography begins to rise again in the distance. For much of the view the northern end of the Sidlaw Hills make up the horizon and towards the right of the view further in the distance the landscape opens up over the Strathmore Valley. The landscape is fairly expansive and of a large scale with a few man-made features such as electricity pylons, communication masts and farm infrastructure. The view will be valued as part of the Sidlaw hills and by walkers in the area.</p>	
Sensitivity	The viewpoint is located at the summit of Dodd Hill and is representative of views experienced by walkers in the area, and is therefore considered to be of High sensitivity.	
Magnitude of Change	<p>Receptors of this view would be 16.6km from the proposed turbine.</p> <p>From this location the proposed Bairds Malt turbine is heavily screened by the intervening landscape with only the blade tips of the proposed turbine theoretically visible within the open vista. The turbine would be barely distinguishable in this view, occupying a negligible extent of both the horizontal and vertical view.</p> <p>The overall magnitude of change for the development is considered to be negligible, as the turbine is unlikely to be discernible within the wider landscape from this location, leading to a <b>moderate/minor</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>There are no operational turbines visible in the same direction as the Bairds Malt turbine from this location. The North Mains of Cononsyth turbine is heavily screened and is unlikely to be visible from this location. The Michelin Tyre Factory turbines appear below the viewer, viewed solely against the landscape, appearing successively in this view. The operational Tealing turbine appears to the rear of the view, the single turbine appearing against the landscape would not feature prominently, viewed against the flat arable landscape to the west.</p> <p>There are theoretical distant views of the Tullo developments, however, from this location they are barely discernible features on the distant horizon.</p> <p>The cumulative magnitude of change for operational projects would be <b>negligible</b>.</p> <p><u>Operational, Consented</u></p> <p>The single turbine at Stotfaulds appears in the same view as the Crofts Farm turbines, the single turbine is a much more prominent feature in this landscape, viewed breaking the horizon from this location..</p> <p>Successive views occur with the nearby Govals and Frawney developments which appear to the rear of the view. The cumulative magnitude of change for consented projects would remain <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>There are also views of the Montquhir, Upper Balmachie and Crofts Farm turbines, although these developments are less prominent features in the view, similar to the Bairds Malt development.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a negligible magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Negligible</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b><i>Moderate/Minor</i></b>



<b>Figure 7.25</b>	<b>Viewpoint 13: Turin Hill</b>	
Description	<p>Viewpoint 13 is taken from <b>E351395 N753524</b>, at the summit of Turin Hill. The view faces south-east towards the turbine which is located ~17.1km from the viewer.</p> <p>This is a grand and open vista from the hill summit, with long distance views to the south and east. The landscape rolls gently allowing for views towards the coast, with the sea visible to the left of the view. The land cover is again dominated by large scale rectilinear fields, in keeping with the predominant landscape character in the area. The fields create a distinct patchwork effect on the surrounding landscape. While bands of shelterbelt and larger scale plantation woodland help to break up the dominant pattern of agriculture a little. To the right of the view the eastern banks of Roscobie Loch can be seen feeding the Balgavies Loch which sits in the middle of the view. The lochs and connecting waterways are lined by dense mature woodland, picking them out of the surrounding landscape. There are a number of man-made features within the wider landscape, these are predominantly farm properties, associated with the surrounding landscape, these farms tend to sit adjacent to other infrastructure such as large outbuildings and sheds, as well as occasional grain silos. The settlement of Letham is also visible to the right of the view beyond the Lochs.</p>	
Sensitivity	The viewpoint represents walkers and other visitors to the summit of Turin Hill and as such is considered to be of high sensitivity.	
Magnitude of Change	<p>Receptors of this view would be 17.1km from the proposed turbine.</p> <p>From this location the proposed development would be a barely discernible feature on the horizon. The intervening landscape provides a significant amount of screening, with only the blade tips of the proposed turbine theoretically visible. The proposed turbine would occupy and affect a negligible extent of both the horizontal and vertical view from this elevated position.</p> <p>The overall magnitude of change for the development is considered to be negligible, as the distance between the viewer and the development and the openness of the view would limit the potential impacts of the proposed development on the view, leading to a <b>moderate/minor</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>The North Mains of Cononsyth turbine appears in the same general view as the proposed Bairds Malt turbine, the single turbine appears almost completely backdropped by the surrounding landscape from this location.</p> <p>The cumulative magnitude of change for operational projects would be <b>negligible</b>.</p> <p><u>Operational, Consented</u></p> <p>The Hillhead of Ascurry turbine appears to the right of the view, the single turbine viewed predominantly against the landscape from this location.</p> <p>Distant views are theoretically possible with the Kenly Farm Windfarm in Fife, located almost 30km from the viewer it is unlikely that the Windfarm will be an easily discernible feature in this view.</p> <p>The cumulative magnitude of change for consented projects would remain <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>Crofts Farm and Montquhir all appear in the same theoretical view as the Bairds Malt turbine from this location. The Crofts Farm turbines are located on the more distant horizon and appear solely against the sky, while the Montquhir turbine is partially screened by the intervening landscape with the visible portion appearing on the horizon against the sky.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a negligible magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Negligible</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b><i>Moderate/Minor</i></b>

<b>Figure 7.26</b>	<b>Viewpoint 14: Tentsmuir Recreational Area</b>	
Description	<p>Viewpoint 14 is taken from <b>E347170 N727786</b> at the edge of the Tentsmuir recreational area, a large coastal area of Fife popular for various outdoor recreation purposes such as cycling, walking and bird watching.</p> <p>Much of the area is covered with tree plantation, but the view looks north-west from the recreational path which circumnavigates the area, just to the east of Tayport, across the Firth of Tay towards Dundee and Broughty Ferry. From this sea level view, the key foreground features of the scene include the rough grasses which grow on the sandy soils at the water's edge and the Firth of Tay itself. The town of Tayport consists of low rise housing which clings to a low hill to the west, partially masked by trees and surrounded by agricultural fields. Across the Tay, Broughty Ferry and Dundee can be seen, with the wind turbines and chimneys associated with an industrial estate clearly visible above the heavily wooded residential areas which flank the Firth. Beyond this low coastal horizon, a secondary but also minor horizon of fields can be discerned, marking a distinction between the urban environment and the agricultural area beyond. This horizon is often topped with trees and other dark vegetation which provides a visual contrast to the patchwork of fields immediately below. In the background of the centre of the view, the Sidlaw Hills rise up with a more barren appearance which is frequently punctuated by large telecommunications masts.</p>	
Sensitivity	This viewpoint was selected to represent recreational users visiting the area and forms part of the Tentsmuir SLA as such is considered to be of <b>High</b> sensitivity.	
Magnitude of Change	<p>Receptors of this view would be 19.1km from the proposed development.</p> <p>From this location the proposed Bairds Malt turbine would appear on the distant horizon, partially screened by the intervening landscape features. With the turbine visible over the expanding Tay estuary as it merges with the North Sea, occupying a negligible extent of both the horizontal and vertical views. The proposed turbine would be barely distinguishable in this vista given the openness and the scale providing by the nearby estuary and coastline.</p> <p>Overall the magnitude of change is considered to negligible, resulting in a <b>moderate/minor</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>Successive views would occur with the operating Michelin turbines to the left of the view, the turbines appearing amongst the urban areas of Dundee as opposed to the surrounding countryside. The cumulative magnitude of change for operational projects would be <b>negligible</b>.</p> <p><u>Operational, Consented</u></p> <p>The Cuthlie turbine appear in the same general view as the Bairds development, neither turbines are predicted to be discernible features within this view</p> <p>Successive views may occur with both the Govals and Frawney wind farms appearing on the more elevated ground to the left of the view, the turbines occupy a similar section of the view to the operating Michelin turbines.</p> <p>The cumulative magnitude of change for consented projects would remain <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>Theoretical views are also possible with the Balmachie, Crofts Farm and Montquhir turbines although the intervening landscape and vegetation features on the opposite banks would limit potential views of these turbines.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a negligible magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Negligible</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Moderate/Minor</b>



<b>Figure 7.28</b>	<b>Viewpoint 16: White Caterthun</b>	
Description	<p>Viewpoint 16 is taken from <b>E354782 N766029</b>, at the summit of the ancient fort of White Caterthun. The view faces southwards towards the turbine which is located ~26.9km from the viewer.</p> <p>The panoramic view offered from the top of the fort is very open, particularly to the east where views are not constrained by the more upland landscapes to the west. The view overlooks a predominantly flat agricultural plain, dominated by large arable fields. The openness of the view allows for visibility of the coast which is located ~25km from the viewer at this location. The landscape is interspersed with woodland features ranging from tree clusters and shelterbelts to large scale plantations. To the rear of the view the landscape takes on a more moorland upland feel, with rough grasses and heather dominating the land cover, while the large scale hills to the west limit long distance views. The view is open and vast, with views over distant settlements such as Brechin, Forfar and Stonehaven all possible from this elevated location. Roads and other key infrastructure features such as pylons and communications masts nestle within the landscape below without being prominent in the grand scale of the vista.</p>	
Sensitivity	The viewpoint represents visitors to the ancient forts and as such is considered to be of high sensitivity.	
Magnitude of Change	<p>Receptors of this view would be 26.9km from the proposed turbine.</p> <p>The proposed turbine appear theoretically visible on the distant horizon within this view. The turbine would be viewed solely against the landscape in this view. The proposed development would occupy a negligible extent of both the horizontal and vertical view from this viewpoint. In reality it is unlikely that the turbine will be an easily discernible feature in this view, at this distance it is not predicted that there will be any significant impacts on the scale or setting of the surrounding open landscape.</p> <p>The overall magnitude of change for the development is considered to be negligible, due to the openness and scale of the surrounding landscape, as well as the distance to the proposed development, leading to a <b>moderate/minor</b> level of effect.</p>	
Cumulative Impact	<p><u>Operational</u></p> <p>Successive views occur to the north-east of the view with the operating Windfarm at Tullo, the turbines are viewed at distance on the distant horizon.</p> <p>The operating North Mains of Cononsyth appears in the view alongside the proposed Bairds Malt turbine, due to the distance between the viewer and the turbine it is not an easily discernible feature within this view.</p> <p>Ark Hill is also theoretically visible to the right of the view but is well screened by the intervening landscape features and is not a prominent feature in this view.</p> <p>The cumulative magnitude of change for operational projects would be <b>negligible</b>.</p> <p><u>Operational, Consented</u></p> <p>Successive views occur to the north-east with the Steelstrath. Brighton Farm turbines.</p> <p>The Whitfield of Dun turbine, Dunswood, Frawney and Govals appear theoretically in a similar view to the proposed Bairds Malt turbine, the Dunswood turbine the most prominent of these developments located within the middle ground between the viewer and the more distant hills of Frawney and Govals.</p> <p>The cumulative magnitude of change for consented projects would remain <b>negligible</b>.</p> <p><u>Operational, Consented, In Planning</u></p> <p>The developments of Crofts Farm, Dubton Farm, Montquhir and Balnacake appear in the same general view as the proposed Bairds Malt turbine. All of these proposed turbines would be viewed at a significant distance from the viewer. The turbines appearing solely against the landscape in this view it is unlikely that they would be easily discernible features within the open vista.</p> <p>Successive views occur to the north-east with Mains of Bridgeton, Hospital Shields Farm and Craggie Farmhouse, the single turbines appearing on the distant horizon over 20km from the viewer.</p> <p>The cumulative magnitude of change for planning projects would remain <b>negligible</b>.</p>	
Type of Effect	On completion of the development the visual effect from this viewpoint would be permanent (reversible) and direct. The development would lead to a negligible magnitude of change and despite the careful design of the project a man-made vertical structure in this area would always lead to a negative effect.	
Assessment of Visual Effects	Sensitivity:	<i>High</i>
	Magnitude:	<i>Negligible</i>
	Type of Effect:	<i>Permanent, direct and negative</i>
	Level of Effect:	<b>Moderate/Minor</b>

# **BAIRDS MALT WIND TURBINE**

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## **Appendix 2.2 – Residential Assessment**

**December 2014**



Project Name: Bairds Malt Wind Turbine

Document Title: Residential Map

Scale: 1:10,000

Key:

- Proposed Turbine Location
- 1 & 2km Radii from Wind Turbine

Level of Effect

- Major
- Major/Moderate
- Moderate
- Moderate/Minor
- None

Primary View Direction

- ▲ Major
- ▲ Major/Moderate
- ▲ Moderate
- ▲ Moderate/Minor
- ▲ None

Properties

- |                             |                         |
|-----------------------------|-------------------------|
| 1. Peasiehill Farm Cottages | 13. Balcathie Farm      |
| 2. Peasiehill Farm House    | 14. Grahamston Cottages |
| 3. Peasiehill Farm Bungalow | 15. Kellie Castle Lodge |
| 4. Krojan Cottages          | 16. The Manse Cottage   |
| 5. Crudie Farm House        | 17. Glebe House         |
| 6. Crudie Farm Cottages     | 18. Bank                |
| 7. Elliot Cottages          | 19. Broomhill           |
| 8. Elliot Bridge            | 20. Loanend             |
| 9. Elliot                   | 21. Fairyknowe          |
| 10. A92 Cottages            | 22. Bankhead            |
| 11. Willow Cottage          | 23. Crudie Acres        |
| 12. Balcathie Farm Cottages | 24. Bottend Cottages    |



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Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

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 Author: SS  
 Checked by: RC  
 Approved By: GM  
 Date: 18/12/2014





**Property Name:** Peasiehill Farm Cottages

**Reference Number:** 1

**Grid Reference:** 361543, 740215

**Distance from Turbine:** 326m

**Number of Properties:** 2

**Property Orientation:** South-East

**Direction of Turbines:** South-East



South-East elevation

#### **Property Description**

Peasiehill Farm Cottages are situated ~326m to the north-west of the proposed development. The properties are semi detached traditional T-shaped one storey cottages. To the south-east of each property there is a modest garden area, bound by a small hedgerow and some metal temporary fencing. To the north-west of the properties there is a small area for car parking. The primary views from the properties overlook the garden areas to the south-east.

#### **Views from Dwelling**

The turbine would be visible from the windows on the south-eastern façade of the buildings, appearing alongside the Bairds Malt buildings which themselves are considerable in height. The turbine would likely be partially screened by these intervening buildings with the upper tower sections hub and blades visible against the sky. The turbine would add a significant vertical feature to the view, which will sit alongside the industrial infrastructure of the maltings.

#### **Views from Environs**

From the garden areas the turbine would be visible, a significant vertical element appearing in the view alongside the malting buildings. From the garden the turbine would occupy a low extent of the vertical views with many of the primary views towards the coast remaining uninterrupted by the proposed turbine. The turbine would occupy a high extent of the vertical view, appearing over the nearby buildings.

**Magnitude of Change:** High

**Level of Effect:** Major



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Peasiehill Farm House

**Reference Number:** 2

**Grid Reference:** 361254, 740363

**Distance from Turbine:** 650m

**Number of Properties:** 1

**Property Orientation:** South

**Direction of Turbines:** South-East



East elevation

### Property Description

Peasiehill Farm House is situated ~650m to the north-west of the proposed development. The property is a traditional two storey L-shaped farm house. The primary views from the property tend to face to the south, looking towards the coastline with views towards the North Sea. The property is set within an area of garden that surrounds all sides of the property, the main garden area is located to the south of the dwelling. To the north and north-west a number of large farm outbuildings mark the property boundary in this direction, to the south-east and east a band of mature shelterbelt trees mark the property boundary. Open views are possible from the garden area to the south.

### Views from Dwelling

Views from the dwelling would be extremely limited, there are minimal windows on the south-eastern façade and these face onto the band of shelterbelt on the property perimeter. In the wintering months when there is less vegetation on the trees the views may become slightly more apparent.

### Views from Environs

Views from the garden area to the south of the property will be possible. The turbine would be viewed to the south-east amongst the maltings buildings, the upper sections of the turbine tower, hub and blades would appear against the sky. Occupying a medium extent of the vertical views and a low extent of the horizontal view. The turbine would not block views towards the coast from this area of the dwelling.

**Magnitude of Change:** Medium

**Level of Effect:** Major/Moderate



AC205

Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Peasihill Farm Bungalow

**Reference Number:** 3

**Grid Reference:** 361247, 740496

**Distance from Turbine:** 722m

**Number of Properties:** 1

**Property Orientation:** South-South-East

**Direction of Turbines:** South-East



South-East elevation

#### **Property Description**

Peasihill Farm Bungalow is situated ~722m to the north-west of the proposed development. The property is a traditional L-shaped farm cottage which has been extended to the north-east. A garden area sits to the south and east of the property, the eastern area of garden is bound by large mature hedgerow. The main views from the property face towards the distant coastline and North Sea, facing in a south-easterly direction, overlooking rolling fields and the Bairds Malt.

#### **Views from Dwelling**

Views from the primary windows on the south-eastern façade of the property would occur, the turbine tower would be partially screened by the intervening buildings of the maltings, however, the upper tower sections, hub and blades would be viewed against the sky above the building line.

#### **Views from Environs**

Views from the garden area would be similar to those experienced in Viewpoint 4 of the Residential Assessment appendix. The viewpoint is taken in front of the property, facing in the direction of the proposed development. The turbine would occupy a low extent of the horizontal view and a medium extent of the vertical view from this location. Views towards the coast would be largely uninterrupted as the turbine appears associated with the more industrial buildings present in the view.

**Magnitude of Change:** Medium

**Level of Effect:** Major/Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Krojan Cottages

**Reference Number:** 4

**Grid Reference:** 361334, 740567

**Distance from Turbine:** 698m

**Number of Properties:** 2

**Property Orientation:** South- East

**Direction of Turbines:** South-East



South-East elevation

#### **Property Description**

Krojan cottages are situated ~698m to the north-west of the proposed development. The dwellings comprise two semi detached traditional stone built single storey cottages. Both properties face to the south east overlooking a garden area, with a small driveway to the north of each property. The primary view from each dwelling faces to the south east towards the coast and each is bound on the southern boundary by a mature hedge-row as well as other screening features present within the garden particularly the initial property next to the access road which has a heavily wooded garden area. There is also an outbuilding at the bottom of the neighbouring garden.

#### **Views from Dwelling**

Views from within the properties may occur as the dwellings are slightly elevated, overlooking the sloping landscape as it rolls away towards the coast beyond the maltings. The views of the development would be similar to those experienced in Viewpoint 4 of the residential figures, taken from the nearby Peasiehill property. The turbine would be viewed alongside the industrial buildings as opposed to blocking the views towards the coast from the properties, occupying a low to medium extent of both the horizontal and vertical view.

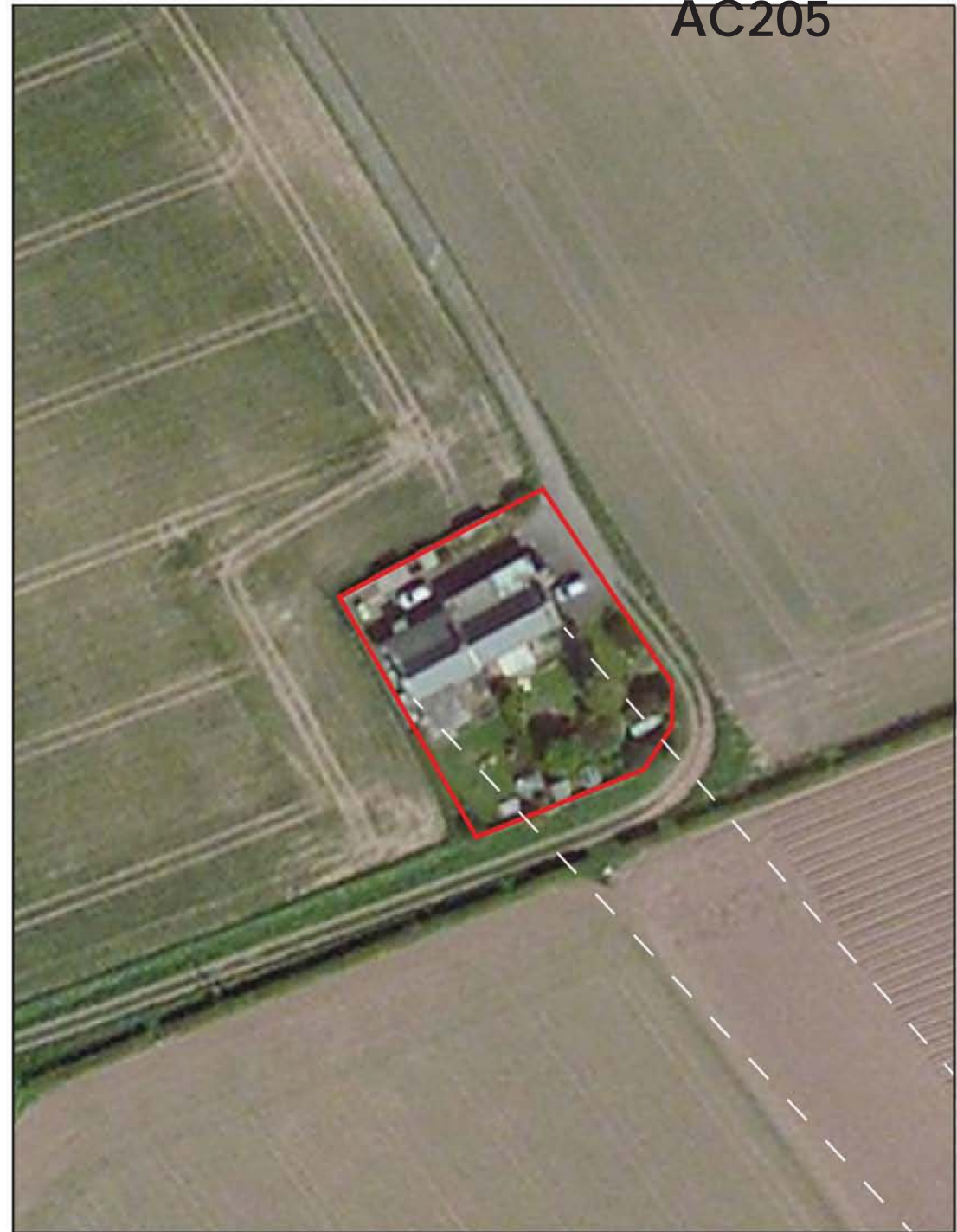
#### **Views from Environs**

Views from the garden areas around the property would also be similar to those experienced in viewpoint 4, although the garden vegetation would provide some screening of the lower tower sections and the maltings. The visible portion of the turbine would be seen against the sky. Again the proposed development would not obstruct the potential views towards the coast and sea beyond, appearing alongside the grain silos and cooling towers of the maltings. The turbine would occupy a medium extent of the vertical view and a low extent of the horizontal view.

**Magnitude of Change:** Medium

**Level of Effect:** Major/Moderate

AC205



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Crudie Farm House

**Reference Number:** 5

**Grid Reference:** 361337, 740723

**Distance from Turbine:** 810m

**Number of Properties:** 1

**Property Orientation:** South- East

**Direction of Turbines:** South-East



South-East elevation

#### **Property Description**

Crudie Farm House is situated ~810m to the north-west of the proposed development. The property is a large traditional build two storey property, with a conservatory on the south western façade of the main dwelling. To the south east of the main property there is a large garden area, bound by mature trees and hedgerows. A small stone wall runs around the perimeter of the property. The main views from the property face to the south east and east, with the conservatory offering 180° views from the north-west to the south-east.

#### **Views from Dwelling**

There may be some views from within the dwelling, with a number of windows located on the south-eastern façade of the building. The intervening screening provided by the boundary woodland would reduce these views slightly, although in the wintering months screening would be lessened as the vegetation cover thins. From the property the turbine would appear against the sky, with the lower tower sections screened by the intervening buildings that comprise the maltings. The turbine would not limit or block the views towards the sea and would occupy a low extent of the horizontal view and low to medium extent of the horizontal view.

#### **Views from Environs**

Views from the garden area would be subject to the same screening features, in the summer months the more dense vegetation would significantly reduce potential views, while in the winter the turbine may be more visible. The turbine would appear in any view alongside the buildings of the maltings as opposed to the open views to the south-west of Arbroath and the Elliot industrial estate towards the North Sea. A worst case scenario view would be similar to that experienced in viewpoint 4 of the residential appendix figures, although slightly further from the proposed development the impacts would be slightly less on the receptors.

**Magnitude of Change:** Medium

**Level of Effect:** Major/Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Crudie Farm Cottages

**Reference Number:** 6

**Grid Reference:** 361227, 740771

**Distance from Turbine:** 918m

**Number of Properties:** 3

**Property Orientation:** West-South-West

**Direction of Turbines:** South-East

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#### **Property Description**

The Crudie Farm Cottages are situated ~918m from the proposed turbine at Bairds Malt. Comprising a small row of three semi detached one storey traditional built cottages. The properties face to the West-South-West overlooking the open farmland landscapes towards the Elliott Water. The properties are bound by a small stone wall which runs along the perimeter marking the garden areas to the rear (West-south-west) of the properties as well as smaller garden areas to the front of the properties. The end terrace on the south-east of the row has a slightly larger garden spreading from the rear around onto the south eastern side of the dwelling. A large farm outbuilding stands on the opposite side of the property marker in this direction.

#### **Views from Dwelling**

The dwellings are orientated away from the proposed development and as such there would be no potential views of the turbine from within these properties.

#### **Views from Environs**

Views from the garden would be extremely limited with some views to the south possible in the direction of the coast. Views of the turbine may be possible, however, the large outbuilding located at the end of the row of cottages would provide significant screening in this direction and there would be no views of the proposed development from the surrounding environs of the cottages.

**Magnitude of Change:** None

**Level of Effect:** None

AC205



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Elliott Cottages

**Reference Number:** 7

**Grid Reference:** 362057, 739553

**Distance from Turbine:** 578m

**Number of Properties:** 10

**Property Orientation:** South-East

**Direction of Turbines:** North-North-West



North-West elevations

### Property Description

Located on the outskirts of Arbroath next to Elliot Bridge, there are a small row of 10 detached properties, situated ~578m from the proposed turbine. A mixture of one and one and a half storey properties, they tend to face over the A92 towards the coast. The properties are bound to the front and rear by gardens, while the perimeter to the south east is marked by a small stone wall which runs along the pavement in front of the dwellings. To the rear the gardens overlook the neighbouring caravan park which occupies the neighbouring field. The primary views from this row of properties face the coast to the south east, in the opposite direction to the proposed development although there are windows on the other facades which may experience some views of the turbine.

### Views from Dwelling

The primary views would remain free from views, facing in the opposite direction to the development. From the rear of the dwellings there would be some views of the development. The turbine appearing alongside the visible portion of the maltings which is partially screened by an area of intervening woodland. The turbine would be viewed predominantly against the sky. The view from these properties is considered in view-point 1 of the residential appendix.

### Views from Environs

Views from the front garden areas would be largely limited by the intervening dwellings. Tot the rear the gardens are subject to some screening features with a mature hedgerow running along the outer perimeter of the majority of the dwellings offering some screening from the neighbouring caravan park. Views would occur from some areas of the garden, with the turbine occupying a low to medium extent of the horizontal view and a medium to high extent of the vertical view, appearing alongside the vertical features of the cooling towers and other buildings associated with the maltings.

**Magnitude of Change:** High

**Level of Effect:** Major



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Elliott Bridge

**Reference Number:** 8

**Grid Reference:** 361944, 739413

**Distance from Turbine:** 685m

**Number of Properties:** 2

**Property Orientation:** South-East

**Direction of Turbines:** North



North-West elevations

#### **Property Description**

West Bay Cottage & Walmar Cottage is situated ~685m to the south of the proposed development. West Bay Cottage is a traditional build Bungalow, while Walmar Cottage is a one and a half storey dwelling. Both properties overlook the coast to the south-east, with the primary views facing in this direction overlooking garden areas, although there are some windows on the northern façade of each property. The properties are bound to the north a red brick wall marking West Bay and a more traditional Stone wall marking the boundary of Walmar Cottage.

#### **Views from Dwelling**

There are no views predicted from within either dwelling. The combination of the perimeter wall and the intervening woodland which surrounds the nearby Elliott Water, limits any potential views from within the dwellings.

#### **Views from Environs**

Views from the surrounding garden areas are also predicted to be limited. The intervening buildings and woodland which surrounds the property to the north would limit. There may be some theoretical visibility from the bottom of the garden at Walmar towards the A92, where the turbine may be viewed over the tree line, although these views would be minimal. The turbine would occupy a low to negligible extent of any view from this area of the garden.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Elliot

**Reference Number:** 9

**Grid Reference:** 361781, 739460

**Distance from Turbine:** 634m

**Number of Properties:** 8

**Property Orientation:** Various

**Direction of Turbines:** North

---

**Property Description**

This small collection of properties make up the small settlement of Elliot, located to the rear of Elliot House, the properties are enclosed by the woodland that surrounds the nearby Elliot Water. The properties are all single storey dwellings, facing out onto the access lane. The properties are set within modest gardens which bound the property to the front and rear.

**Views from Dwelling**

There are no views predicted from within any of the dwellings the dense woodland between the proposed site and the settlement would limit any potential views.

**Views from Environs**

There are no predicted views from any of the environs surrounding the properties. The area feels very enclosed by the surrounding screening features.

**Magnitude of Change:** None

**Level of Effect:** None



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** A92 Cottages

**Reference Number:** 10

**Grid Reference:** 361104, 739241

**Distance from Turbine:** 1.3km

**Number of Properties:** 2

**Property Orientation:** South-East

**Direction of Turbines:** North-East



North-West elevation

#### **Property Description**

These cottages are located at the side of the A92 ~1.3km to the south-west of the proposed development. The dwelling comprises two semi detached one storey cottages. The primary view from each dwelling faces towards the south-east away from the proposed development, although there are windows on the north-west façade of one of the properties, which may experience some views. To the front and rear of each property there is a small garden area, bound by a drystone wall which runs around the perimeter of both properties.

#### **Views from Dwelling**

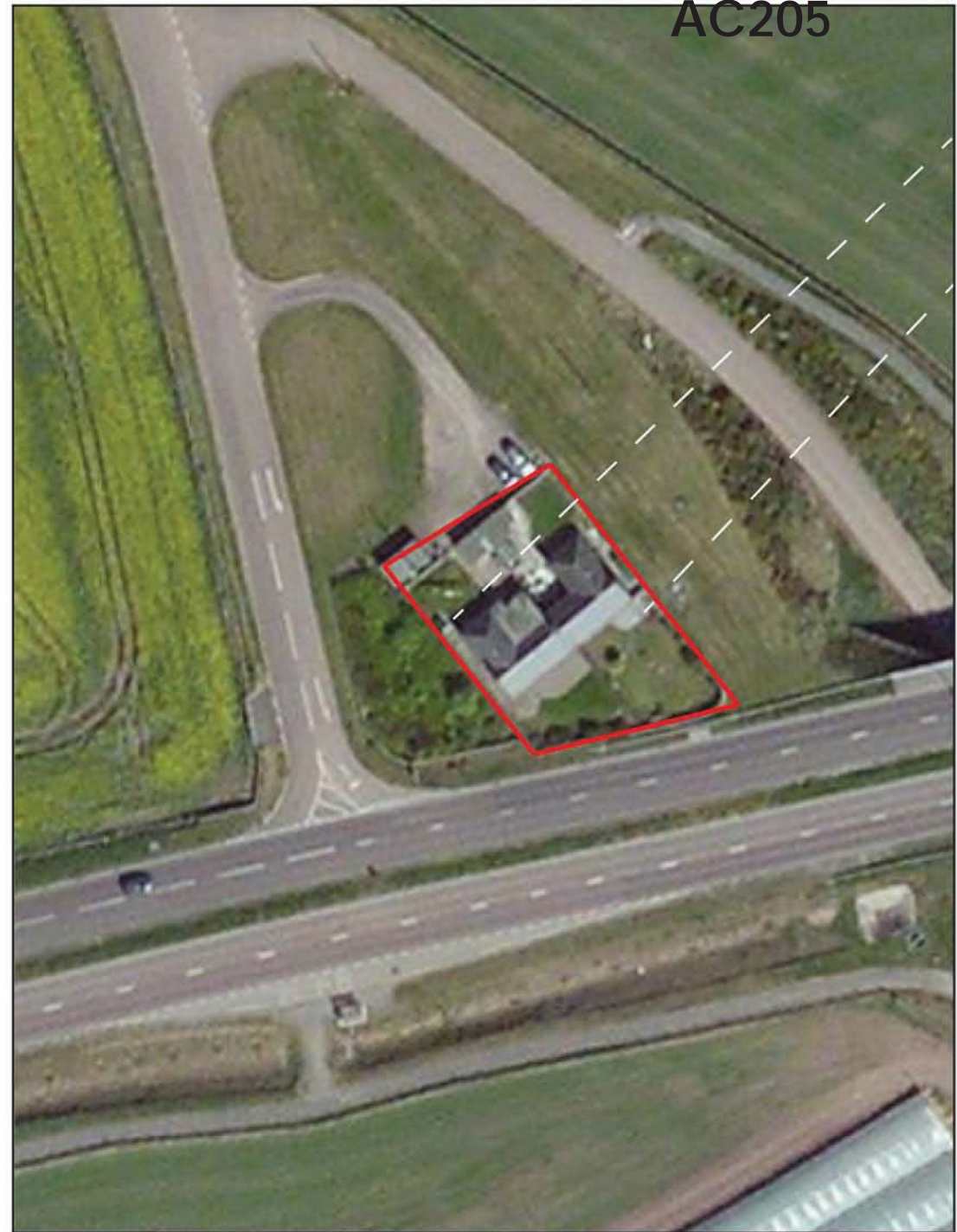
Views are predicted from the dwelling on the north-eastern side of the development, with some windows on this façade, views may be possible towards the proposed turbine. The primary views would remain unaffected. Where visible the turbine would be viewed amongst an area of woodland and the maltings buildings on the horizon. The turbine tower would be partially screened by the intervening woodland, with the visible portion appearing against the sky. The turbine would occupy a negligible extent of the horizontal view and a low to medium extent of the vertical view over this distance.

#### **Views from Environs**

Views from the garden areas would be possible, with the intervening buildings providing a little bit of screening of the development. Views would be similar to those experienced in Viewpoint 2 of the residential assessment appendix. The lower tower sections would be screened from view by the intervening shelter belt, with the remainder of the turbine appearing against the sky, viewed alongside the maltings buildings. The turbine would occupy a low extent of the horizontal and vertical views from this location.

**Magnitude of Change:** Low

**Level of Effect:** Moderate



AC205

Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Willow Cottage

**Reference Number:** 11

**Grid Reference:** 361029, 739380

**Distance from Turbine:** 1.1km

**Number of Properties:** 1

**Property Orientation:** South-West

**Direction of Turbines:** North-East



South-East elevation

### Property Description

Willow Cottage is situated ~1.1km to the south-west of the proposed turbine. The property is a single storey cottage, which has been extended and modernised over time. The primary views from the property overlook the garden areas to the south-west and north-east of the property. The perimeter is marked by a drystone wall to the front (south-west) and a brown wooden fence and some intermittent trees to the rear (north-east). The property is accessed via a short driveway to the south-east of the property.

### Views from Dwelling

Views from the dwelling would occur from the rear windows which face in the direction of the proposed development. The views experienced would be similar to those experienced in viewpoint 2 in the residential assessment. The turbine would occupy a low extent of both the horizontal and vertical views. With the vegetation on the perimeter offering limited potential screening from within the property.

### Views from Environs

Views from the garden areas to the rear of the property would be similar to those experienced in Viewpoint 2 of the residential assessment. The base of the tower would be hidden from view by the intervening shelterbelt woodland. The remainder of the turbine would be viewed predominantly against the sky alongside other vertical features such as wooden electricity pylons and the buildings that comprise the maltings. The turbine would occupy a low extent of both the horizontal and vertical view from these areas.

**Magnitude of Change:** Low

**Level of Effect:** Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Balcathie Farm Cottages

**Reference Number:** 12

**Grid Reference:** 360960, 739487

**Distance from Turbine:** 1.1km

**Number of Properties:** 2

**Property Orientation:** South-West

**Direction of Turbines:** North-East



North-West elevation

### Property Description

Balcathie Farm Cottages are situated ~1.1km to the south-west of the proposed turbine. The properties are semi-detached, traditional stone built single storey cottages. The primary view from each dwelling faces to the south-west, overlooking the main garden areas located in front of the properties. As well as the main garden area there is a smaller garden area located to the rear of the properties. The perimeter around the properties is marked by a small drystone wall to the front and side, while the back is marked by a post-and-wire fence which runs around the edge of the neighbouring field.

### Views from Dwelling

Views from the dwelling would be restricted to the rear of the properties. The views would be similar to those experienced in Viewpoint 2 of the residential assessment figures. The turbine appearing over the neighbouring field. The lower tower is hidden from view by an area of shelterbelt woodland, with the remainder of the turbine viewed against the sky alongside the industrial buildings of the maltings. The turbine would occupy a negligible extent of the horizontal view and a low extent of the vertical view.

### Views from Environs

The primary garden areas to the front of the properties would be largely free from views. The primary views face to the south-west and the south away from the development, while potential views towards the development are limited by the dwellings. There may be some views from the edges of the gardens, to the south-east and north-west of the properties respectively. From these locations the views will be similar to those experienced in Viewpoint 2.

**Magnitude of Change:** Low

**Level of Effect:** Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Balcathie Farm

**Reference Number:** 13

**Grid Reference:** 360960, 739487

**Distance from Turbine:** 1.2km

**Number of Properties:** 1

**Property Orientation:** South-West

**Direction of Turbines:** North-East

#### **Property Description**

Balcathie Farm House is situated ~1.2km to the south-west of the proposed development. The property is a large traditional two storey dwelling. The property is set within fairly large grounds with gardens surrounding the property. The property is set within woodland, with mature shelterbelts running around the perimeter of the property enclosing the dwelling and gardens. The property is accessed via a short driveway to the south of the main dwelling. A stone wall covered in part by vegetation mark the outer perimeter of the environs surrounding the property.

#### **Views from Dwelling**

Views from the dwelling are predicted to be extremely limited, with the primary views to the front of the property facing away from the proposed development. Views from the rear would be heavily screened by the mature woodland which surrounds the property.

#### **Views from Environs**

Similarly views from the primary garden areas to the west and south-west of the main dwelling would experience no views, with the property intervening between the potential receptor and any views, combined with the woodland features there are no predicted significant views from the areas surrounding the property. There may be some oblique views on the access to the property may occur although these will be fleeting and largely screened by vegetation and nearby farm outbuildings.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Grahamston Cottages

**Reference Number:** 14

**Grid Reference:** 360109, 739976

**Distance from Turbine:** 1.7km

**Number of Properties:** 12

**Property Orientation:** South-East

**Direction of Turbines:** East



South-East elevations

### Property Description

Grahamston Cottages are made up of 12 semi detached two-storey cottages, situated ~1.7km to the west of the proposed development. The cottages face in a generally south-easterly direction looking towards the distant coastline with views towards the North-Sea. To the front and rear of each property there is a modest garden area, with hedgerows marking the property boundaries to the rear and a mixture of hedgerows and walls to the front. Each property has a driveway to the side of the main dwelling.

### Views from Dwelling

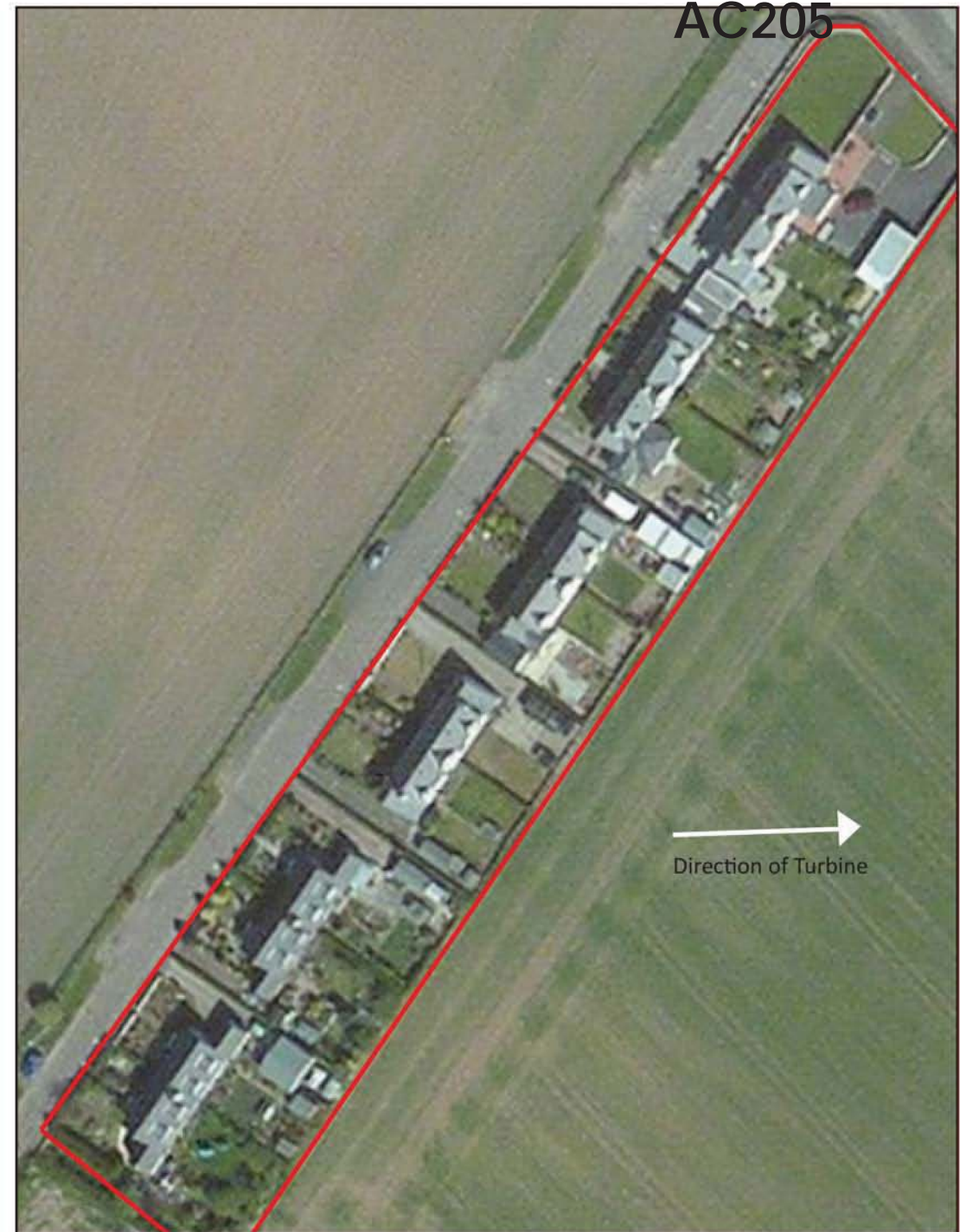
The property orientation means that views are unlikely from the rear of the properties. The primary viewing direction would remain unaffected by the proposed development. The proposed development would not interrupt any views towards the coastline. If views were to occur the turbine would be partially screened by the band of shelterbelt woodland which runs along the Elliot Water. The upper sections of the turbine would be viewed against the sky above the tree line, similar to the views experienced in Viewpoint 3 of the residential assessment.

### Views from Environs

Views from the garden area would be similar to those experienced in viewpoint 3, with the main views towards the coastline unaffected the turbine would occupy a negligible extent of both the horizontal and vertical view from these areas. There are other features present within the different gardens which would further limit these potential views.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Kellie Castle Lodge

**Reference Number:** 15

**Grid Reference:** 360175, 740075

**Distance from Turbine:** 1.7km

**Number of Properties:** 1

**Property Orientation:** South-East

**Direction of Turbines:** East



South-East elevation

#### **Property Description**

Kellie Castle Lodge is situated 1.7km to the north-west of the proposed turbine. The dwelling is situated at the end of the driveway to Kellie Castle. It is a one and a half storey property. The primary views face to the south-east, overlooking a small garden area and the castle driveway. To the rear of the dwelling there is a paved driveway area with garage outbuilding.

#### **Views from Dwelling**

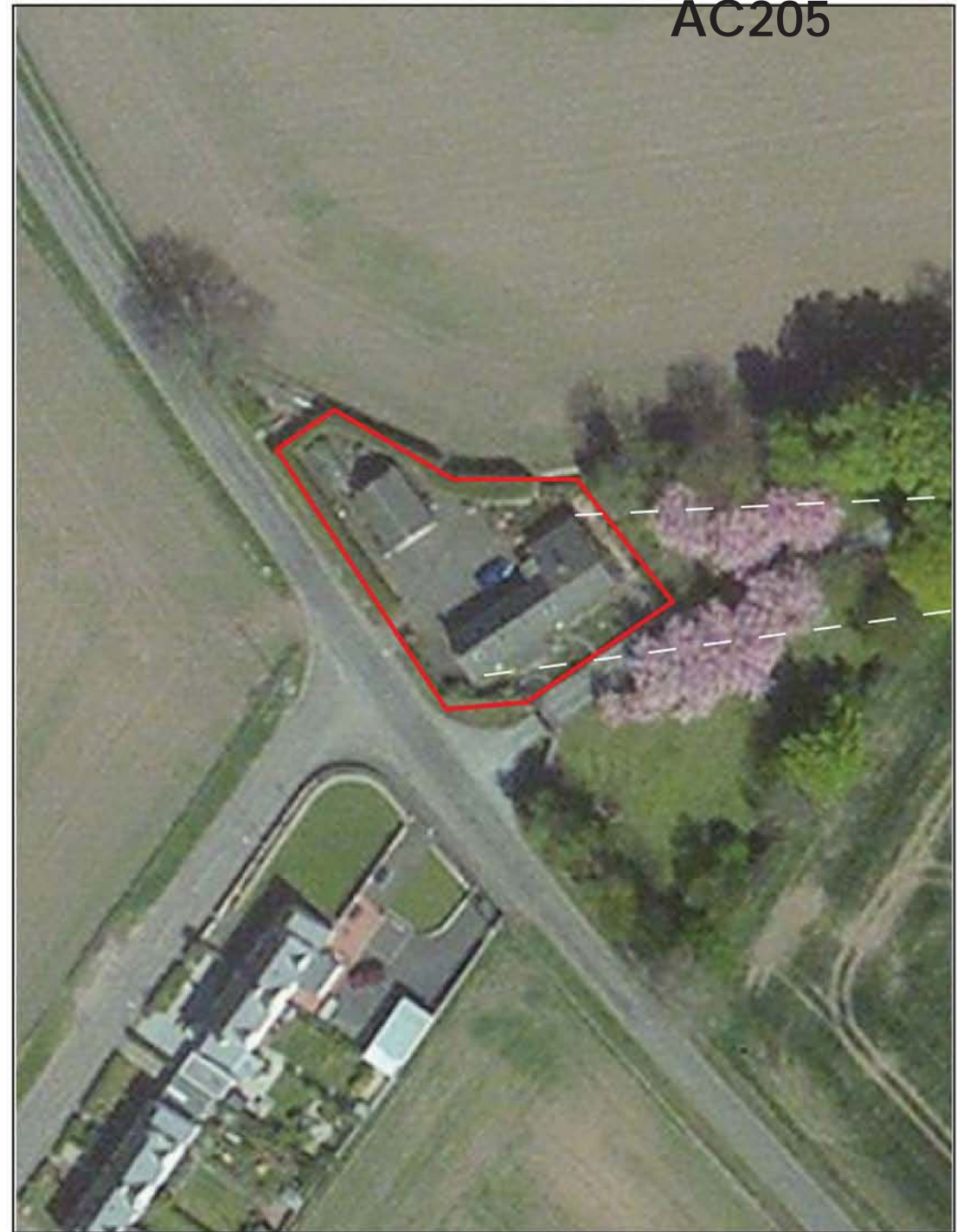
The driveway is bound to the south by a band of mature trees, these would completely screen any potential views of the development from within the dwelling.

#### **Views from Environs**

Views from the garden areas to the south of the property would be subject to the same screening features as the dwelling with the woodland limiting any potential views. In the wintering months when leaf cover is less prominent there may be some views possible, however, as well as the trees nearby there woodland that lines the Elliot Water also provides a great deal of screening as seen in viewpoint 3. It is unlikely that there will be any views of the development from the areas surrounding this property.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



AC205

Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** The Manse Cottage

**Reference Number:** 16

**Grid Reference:** 360075, 740214

**Distance from Turbine:** 1.8km

**Number of Properties:** 1

**Property Orientation:** South-East

**Direction of Turbines:** East-South-East



East elevation

**Property Description**

The Manse Cottage is situated ~1.8km to the west-north-west of the proposed development. The property is a traditional stone built one storey L-shaped cottage. To the front of the property there is a small garden which is bound by a hedge, with the main garden area to the rear of the property. The property is accessed via a short driveway from the nearby minor road.

**Views from Dwelling**

There are no predicted views from within the dwelling. The surrounding area is heavily wooded, screening any potential views of the development.

**Views from Environs**

There are no predicted views from the garden areas at the property the local woodland screening any potential views of the turbine.

**Magnitude of Change:** None

**Level of Effect:** None



Approximate boundary of domestic curtilage and line of sight from dwelling

**Property Name:** The Glebe House

**Reference Number:** 17

**Grid Reference:** 360137, 740383

**Distance from Turbine:** 1.7km

**Number of Properties:** 1

**Property Orientation:** South-West

**Direction of Turbines:** East-South-East

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#### **Property Description**

The Glebe House is situated ~1.7km to the west-north-west of the proposed development. The dwelling is a grand two storey traditional stone built property set within an area of woodland which surrounds the property on all sides. A large garden area surrounds the property on all sides, while a stone wall marks the perimeter alongside the dense mature woodland. The property is accessed via a short driveway from the minor road which runs by the front of the house.

#### **Views from Dwelling**

There are no predicted views from within the dwelling. The surrounding area is heavily wooded, screening any potential views of the development.

#### **Views from Environs**

There are no predicted views from the garden areas at the property the local woodland screening any potential views of the turbine.

**Magnitude of Change:** None

**Level of Effect:** None



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Bank

**Reference Number:** 18

**Grid Reference:** 360652, 740641

**Distance from Turbine:** 1.3km

**Number of Properties:** 4  
(including new build under construction)

**Property Orientation:** South

**Direction of Turbines:** South-East

---

### Property Description

This is a small collection of properties including one property which is under construction currently, situated ~1.3km to the north-west of the proposed development. The original dwelling of Bank Farm House is a traditional stone built two storey farmhouse. The primary views from the dwelling face to the south, with an internal courtyard to the east overlooking the farm outbuildings. The other two properties have been created from a conversion of the existing outbuildings at the farm, these are renovated traditional stone built dwellings which have been split to create two separate single storey properties. To the south of this cluster a new property is currently under construction.

### Views from Dwelling

Views from Bank Farm House are not predicted, with the intervening outbuildings screening potential views. From the Bank Farm Cottages, the property on the eastern side of the two has windows which will face towards the proposed development. From here the turbine will be viewed alongside the visible portion of the maltings buildings and intermittent shelter belt trees which are present in the intervening landscape. The turbine would occupy a low extent of both the horizontal and vertical view from this location. Views are unknown from the new build property but potential mitigation would be the planting of screening vegetation such as hedgerow trees on the eastern boundary of the garden.

### Views from Environs

There is a small garden area to the south of the Banks Farm House, views from this area are possible but will likely be screened by the addition of the new build property which is situated to the south-east. The Banks Farm Cottages have a modest garden area to the front of each property, with the eastern most property having a slightly larger area on the eastern side of the property as well. Views from this area of the garden will be similar to those experienced at the windows on this façade of the dwelling. Views from the new build are unknown but following the pattern of the nearby development it is predicted the garden area will be located to the south of the dwelling, views from this area may be possible and will be similar to those experienced at the neighbouring cottage. The turbine would occupy a low extent of both the horizontal and vertical view from this area.

**Magnitude of Change:** Low

**Level of Effect:** Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Broomhill

**Reference Number:** 19

**Grid Reference:** 360579, 740862

**Distance from Turbine:** 1.5km

**Number of Properties:** 1

**Property Orientation:** South

**Direction of Turbines:** South-East



South elevation

#### **Property Description**

Broomhill is situated ~1.5km to the north-west of the proposed development. The property is a traditional stone built T-shaped building, a conservatory has been added to the southern façade in more recent times. The property perimeter is marked by a small drystone wall, which surrounds the garden area to the south of the main dwelling. To the north a cluster of farm outbuildings enclose the property creating a small courtyard to the north. The property is accessed via a short driveway from the B9127 which runs past the farm.

#### **Views from Dwelling**

Views from the conservatory which offers panoramic views to the south, east and west would be possible. The turbine would be viewed from this area of the property, alongside the visible maltings buildings and would add a vertical feature to the view. The turbine would not block any views towards the distant coastline appearing with the industrial elements already present in the view. The turbine would occupy a negligible extent of the horizontal view and a low extent of the vertical view.

#### **Views from Environs**

Views from the garden area to the south would be similar to those experienced from within the conservatory area of the property. The open views from the garden towards the coast would remain largely unaffected with the turbine appearing alongside the maltings towers and buildings, occupying a negligible extent of the horizontal view and a low extent of the vertical view.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Loanend

**Reference Number:** 20

**Grid Reference:** 360430, 741151

**Distance from Turbine:** 1.8km

**Number of Properties:** 2

**Property Orientation:** South-East

**Direction of Turbine:** South-East

---

#### **Property Description**

Loanend is situated ~1.8km to the north-west of the proposed development. The property is a traditional L-shaped building split into two single storey cottages. There are garden areas for each property to the front and rear of the building. The property perimeter is marked by a drystone wall to the east and a wooden fence and a coniferous hedgerow on the other sides. The property is accessed via the B9127 which runs past the property.

#### **Views from Dwelling**

Views from the dwelling would be limited by the vegetation which lines the property boundary. There may be some views of the turbine and where these do occur the turbine would appear within an open vista, occupying a negligible extent of both the horizontal and vertical view. The turbine would be viewed predominantly against the sky, partially screened by intervening feature present in the wider landscape such as trees and shelterbelt.

#### **Views from Environs**

Views from the garden would be limited again by the vegetation which surrounds the properties, with no views occurring in the northern areas of the garden to the rear of the dwellings. There may be some oblique views from the driveway which passes in front of the houses, these views again would see the turbine occupy a negligible extent of the open vista.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Fairyknowe

**Reference Number:** 21

**Grid Reference:** 361115, 741342

**Distance from Turbine:** 1.4km

**Number of Properties:** 1

**Property Orientation:** South-East

**Direction of Turbine:** South-South-East

#### Property Description

Fairyknowe is a traditional two storey farmhouse situated ~1.4km to the north-north-west of the proposed development. To the west of the property there is a large fairly secluded garden area. The property is bound in the main by a drystone wall with an area of hedgerow on the southern edges as well. The property is accessed via a short driveway from the local minor road and runs to the north of the property.

#### Views from Dwelling

There will be some direct views towards the proposed development from the southern side of the property with windows facing out over the open landscape, the turbine would appear predominantly against the sky from these areas, the turbine occupying a negligible extent of the horizontal views which are open and far reaching and a low extent of the vertical views.

#### Views from Environs

The garden area to the west of the property is fairly secluded with trees and other vegetation forming a boundary to the area, where gaps appear in this vegetation there will be some views to the south towards the proposed development. Similar to the views from the property the turbine appearing against the sky. The turbine would occupy a negligible portion of the overall open and far reaching views that are possible to the south and west from this area around the property. Oblique views from the driveway would be screened by the stone wall which lines this area of the property.

**Magnitude of Change:** Medium

**Level of Effect:** Major/Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling

**Property Name:** Bankhead

**Reference Number:** 22

**Grid Reference:** 360947, 741754

**Distance from Turbine:** 1.9km

**Number of Properties:** 1

**Property Orientation:** South-East

**Direction of Turbine:** South- East

---

#### **Property Description**

Bankhead is a traditional stone built single storey farm cottage situated ~1.9km to the north-west of the proposed development. The property is bound by a series of large outbuildings to the north and east, while a significant band of mature coniferous shelterbelt lines the property perimeter on all sides. The property is accessed via a local minor road from the B9127.

#### **Views from Dwelling**

The dense coniferous vegetation would limit any potential views of the proposed development from within the dwelling.

#### **Views from Environs**

The garden area to the south is lined by dense vegetation and there would be no views of the proposed development from these areas. There may be some oblique views when travelling along the local road towards the dwelling, the turbine would appear in context with the more prominent metal electricity pylons that line the horizon in the area, with the turbine appearing as a minor feature on the horizon.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Crudie Acres

**Reference Number:** 23

**Grid Reference:** 360947, 741754

**Distance from Turbine:** 1.6km

**Number of Properties:** 1

**Property Orientation:** South-East

**Direction of Turbine:** South

#### **Property Description**

Crudie Acres is a modern build T-shaped property situated ~1.6km to the north of the proposed development. The property is bound to the north by a series of large farm outbuildings, with a significant garden area running to the south-east of the main property. The garden appears bound by an area of mature hedgerow while a cluster of woodland is located on the southern edge of the garden. A row of mature shelterbelt trees occupy the landscape to the immediate south of the property adding further enclosure. The property is accessed via a short minor road from the B9127 to the south.

#### **Views from Dwelling**

Views from within the property would be extremely limited with the significant areas of screening present both within the garden and in the surrounding landscape it is not predicted that the turbine would be a prominent feature in the views from within the property. Where visible the turbine would be viewed in context with a series of large metal electricity pylons which run directly to the south of the property. The turbine would occupy a low extent of both the horizontal and vertical view.

#### **Views from Environs**

The views from the garden area would also be limited due to the intervening vegetation. There may be some views when travelling away from the property, these views would be direct for a short time with the turbine appearing against the sky on the horizon. The turbine would occupy a low extent of the horizontal and vertical view for a short time view alongside the Maltings infrastructure.

**Magnitude of Change:** Low

**Level of Effect:** Moderate



Approximate boundary of domestic curtilage and line of sight from dwelling



**Property Name:** Bottlend Cottages

**Reference Number:** 24

**Grid Reference:** 362201, 741794

**Distance from Turbine:** 1.7km

**Number of Properties:** 2

**Property Orientation:** South-East

**Direction of Turbine:** South-West

---

**Property Description**

Bottlend Cottages consist of a terraced row of two bungalows situated ~1.7km to the north-east of the proposed development. The properties overlook an internal courtyard formed by the stand alone garages located on the southern boundary of the properties. Each property has a modest garden on the northern side of the main dwellings. Set back from the local road the properties are bound by a small wall and wooden fence, with an area of mature woodland bounding the nearby cemetery forming the south-eastern marker of the property. Located at the side of the local East Muirlands Road.

**Views from Dwelling**

The orientation of the properties and the intervening built features would completely screen any potential views towards the turbine from within the dwellings.

**Views from Environs**

Views from the areas surrounding the properties would also be limited with the properties screening views from the northern areas, the garages screening views from the southern areas. Intervening shelterbelts in the wider landscape would further screen any potential views from the short driveway.

**Magnitude of Change:** Negligible

**Level of Effect:** Moderate/Minor



Approximate boundary of domestic curtilage and line of sight from dwelling



Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP01 - A92, Elliot

Scale: 1:10,000 @ A3

Key:

- Proposed Turbine Location
- ◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: **E362065 N739470**  
 Viewpoint Elevation: **1m (A.O.D)**  
 View Direction: **339°**  
 Distance to Turbine: **658m**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **19/07/2013**  
 Time Taken: **12:18**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Low**  
 Overall: **Moderate**

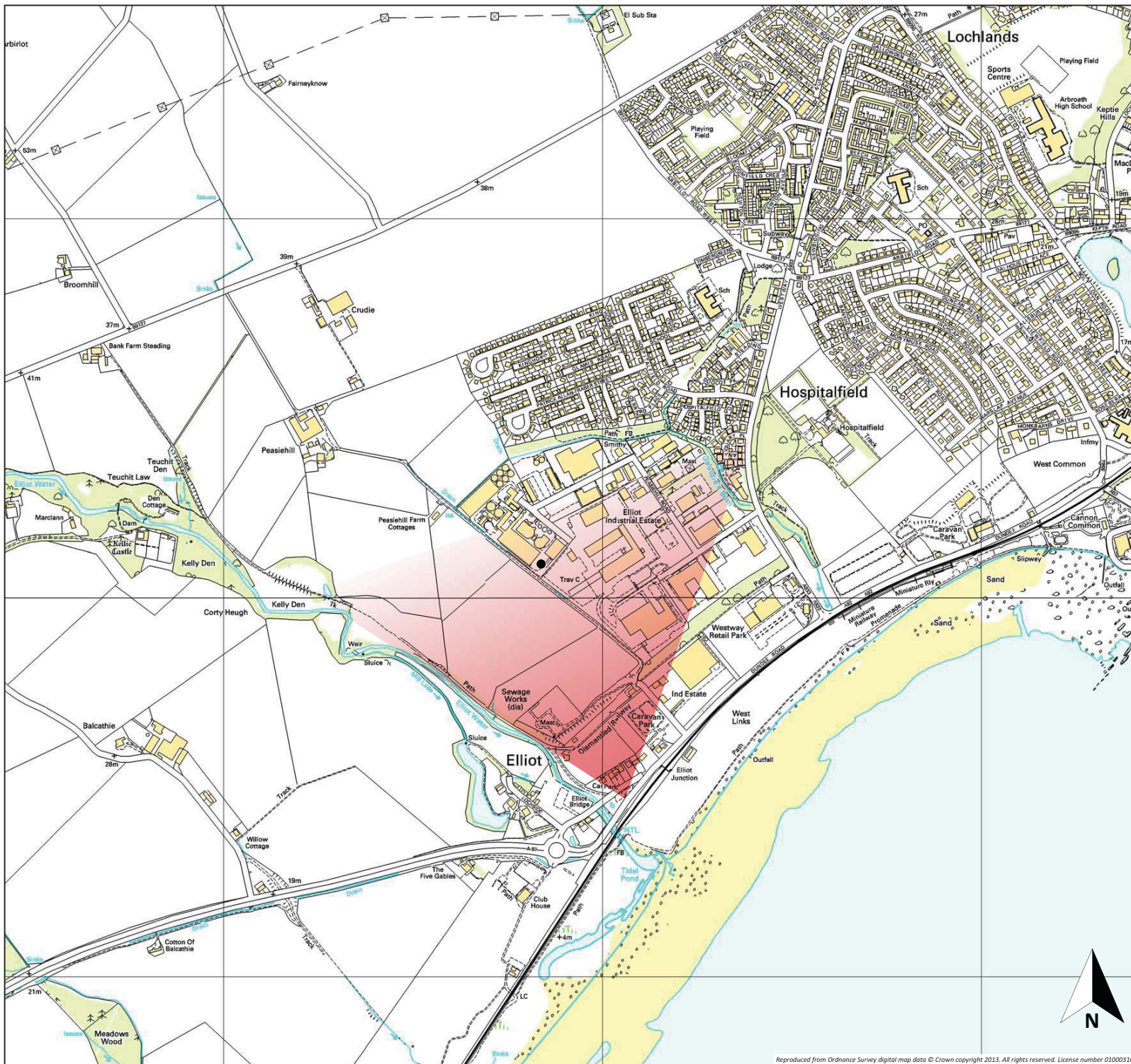
*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

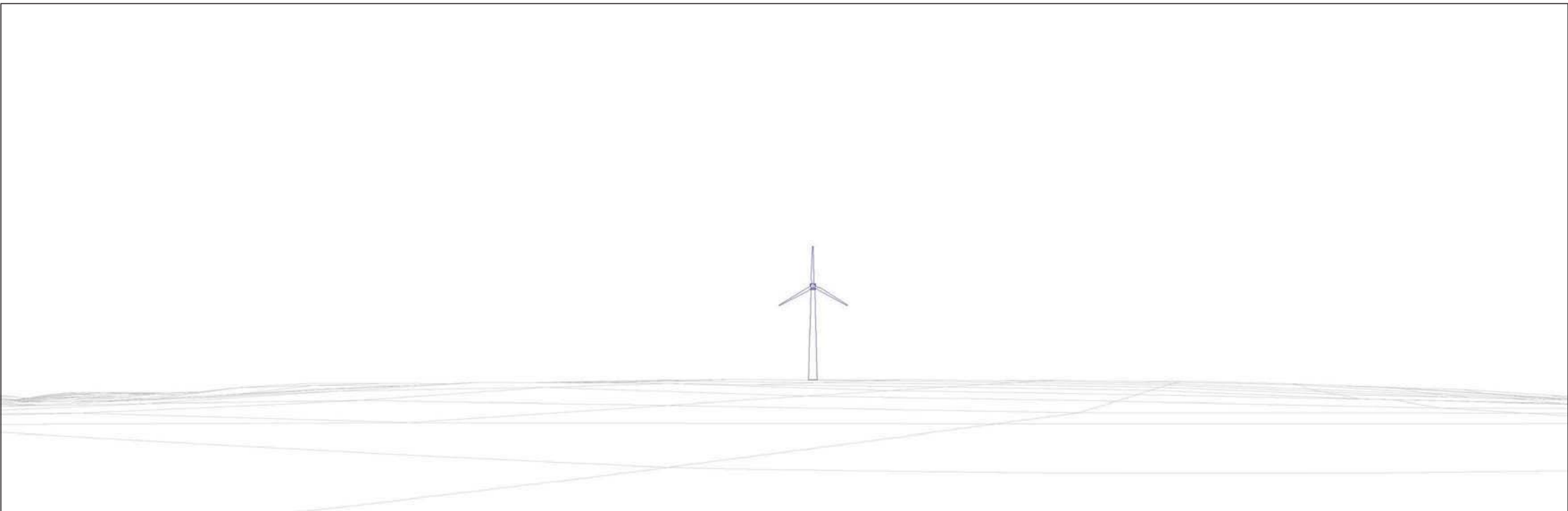
Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/App 2.3a**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **18/12/2014**







VP01 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP02 - Balcathie

Scale: 1:10,000 @ A3

Key:

- Proposed Turbine Location
- ◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: E360975 N739404

Viewpoint Elevation: 20m (A.O.D)

View Direction: 49°

Distance to Turbine: 1.1km

Visibility: Hub

Camera Type: Nikon D3100

Focal Length: 35mm

Effective Focal Length: 54.6mm

Date Taken: 19/07/2013

Time Taken: 13:26

Height above elevation: 1.5m

### Visual Impact

Magnitude: High

Sensitivity: Low

Overall: Moderate

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/App 2.3b

Version: 1.0

Author: SS

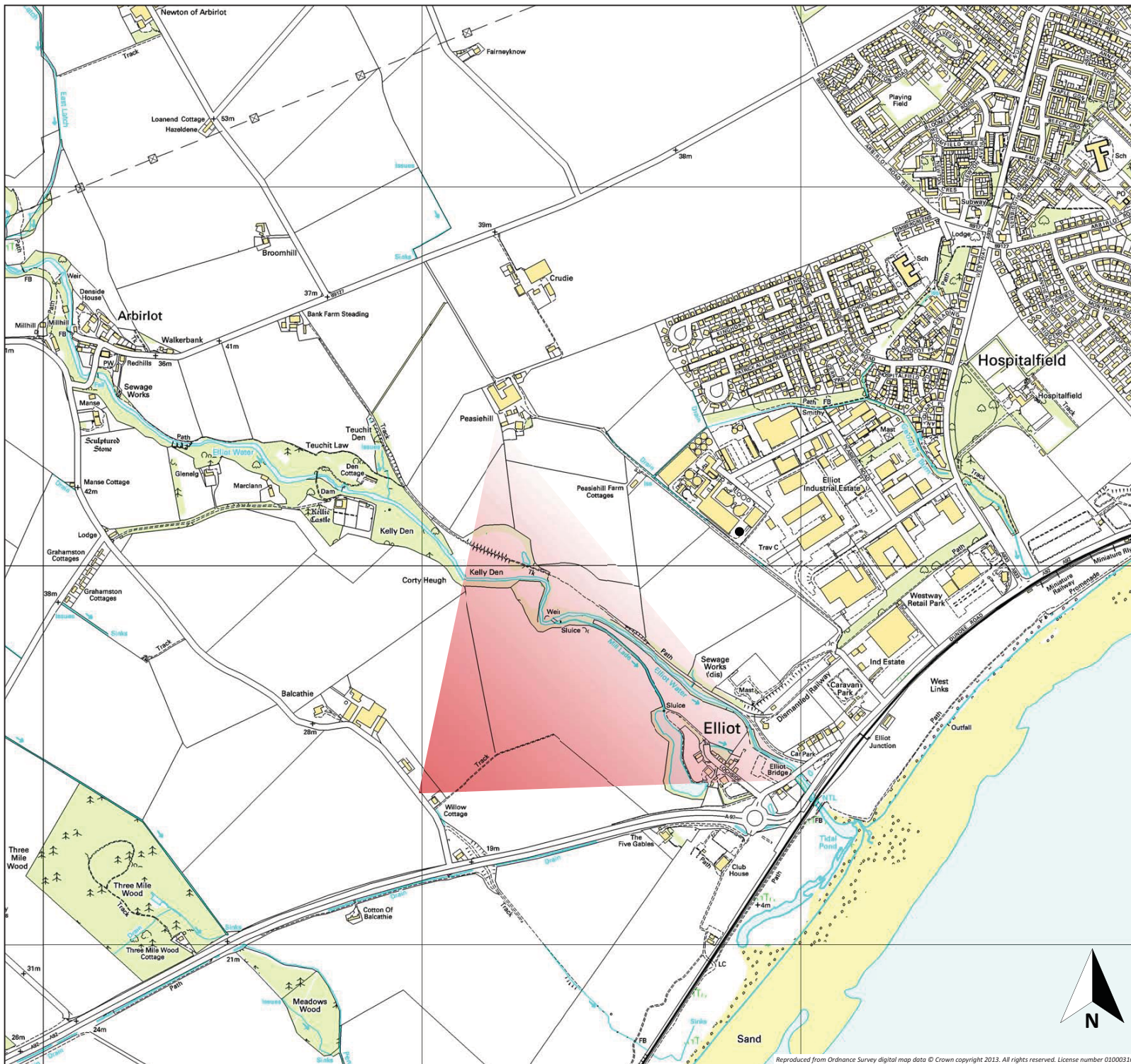
Checked by: RC

Approved By: GM

Date: 18/12/2014



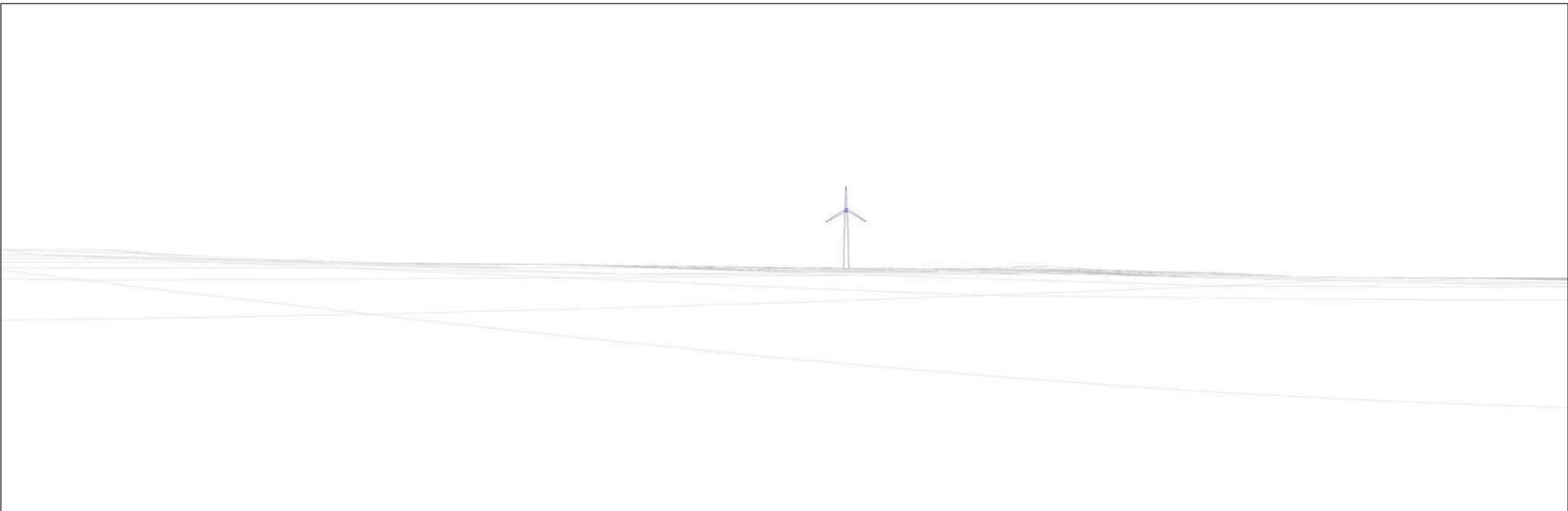
©Green Cat Renewables Ltd







VP02 - WIRELINE DRAWING



VP02 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine  
Document Title: VP03 - Grahamston Cottages

Scale: 1:10,000 @ A3

Key:  
● Proposed Turbine Location  
◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: **E360198 N740013**  
Viewpoint Elevation: **38m (A.O.D)**  
View Direction: **83°**  
Distance to Turbine: **1.6km**  
Visibility: **Hub**  
Camera Type: **Nikon D3100**  
Focal Length: **35mm**  
Effective Focal Length: **54.6mm**  
Date Taken: **19/07/2013**  
Time Taken: **13:37**  
Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
Sensitivity: **Low**  
Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd

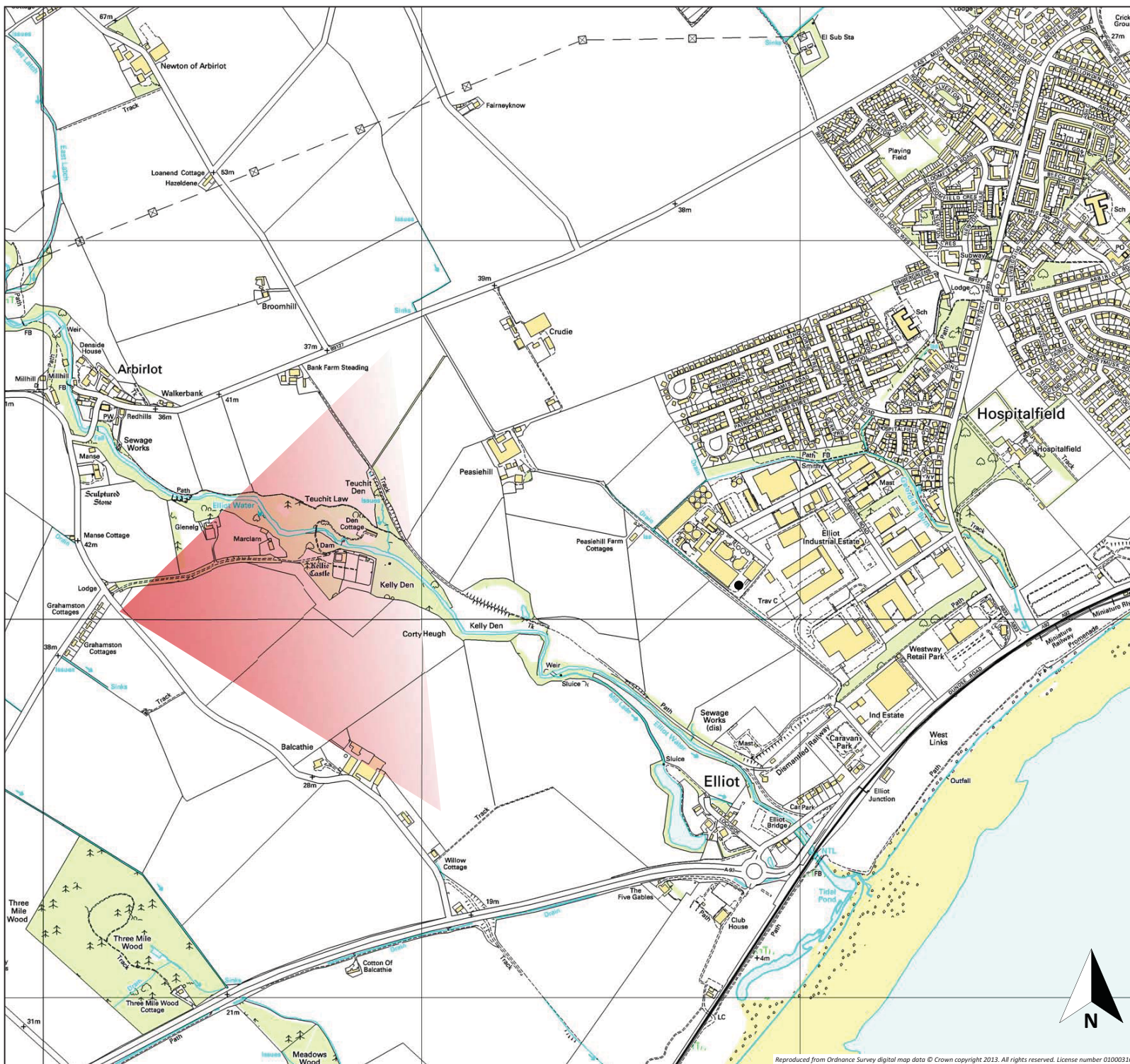


Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/App 2.3c**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **18/12/2014**



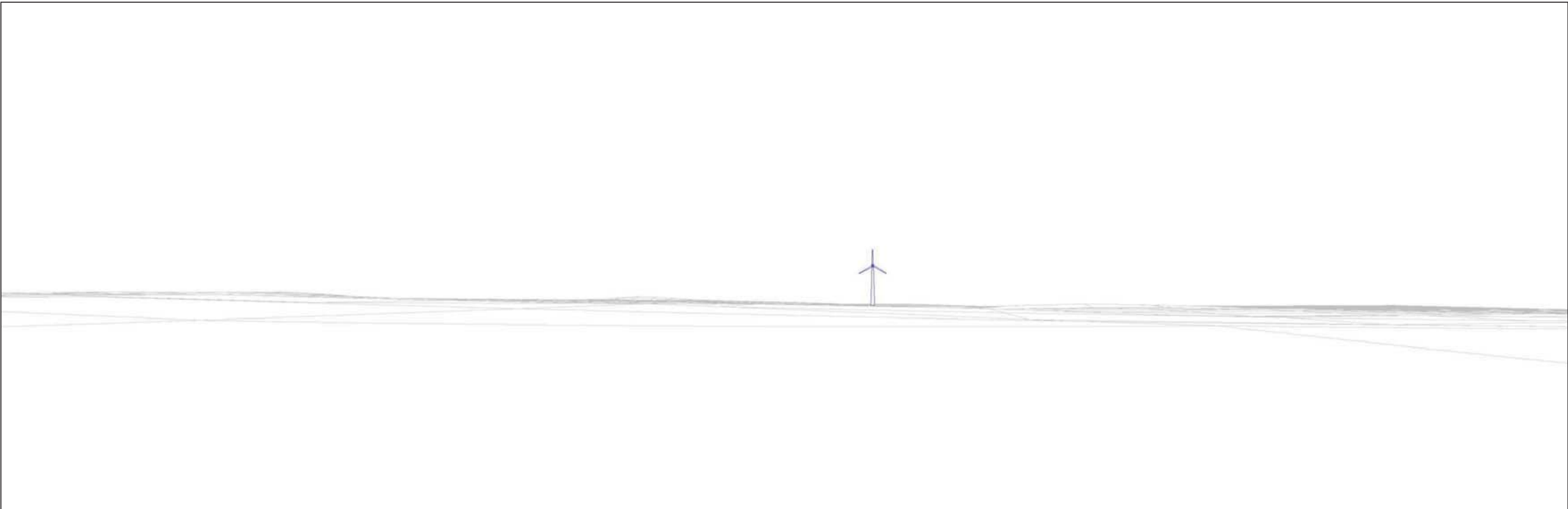
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VP03 - WIRELINE DRAWING





VP03 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP04 - Peasiehill

Scale: 1:10,000 @ A3

Key:



Proposed Turbine Location



76° Field of View

### Viewpoint Information

Viewpoint Location: E361259 N740492

Viewpoint Elevation: 32m (A.O.D)

View Direction: 123°

Distance to Turbine: 710km

Visibility: Hub

Camera Type: Nikon D3100

Focal Length: 35mm

Effective Focal Length: 54.6mm

Date Taken: 19/07/2013

Time Taken: 14:07

Height above elevation: 1.5m

### Visual Impact

Magnitude: High

Sensitivity: Low

Overall: Moderate

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/App 2.3d

Version: 1.0

Author: SS

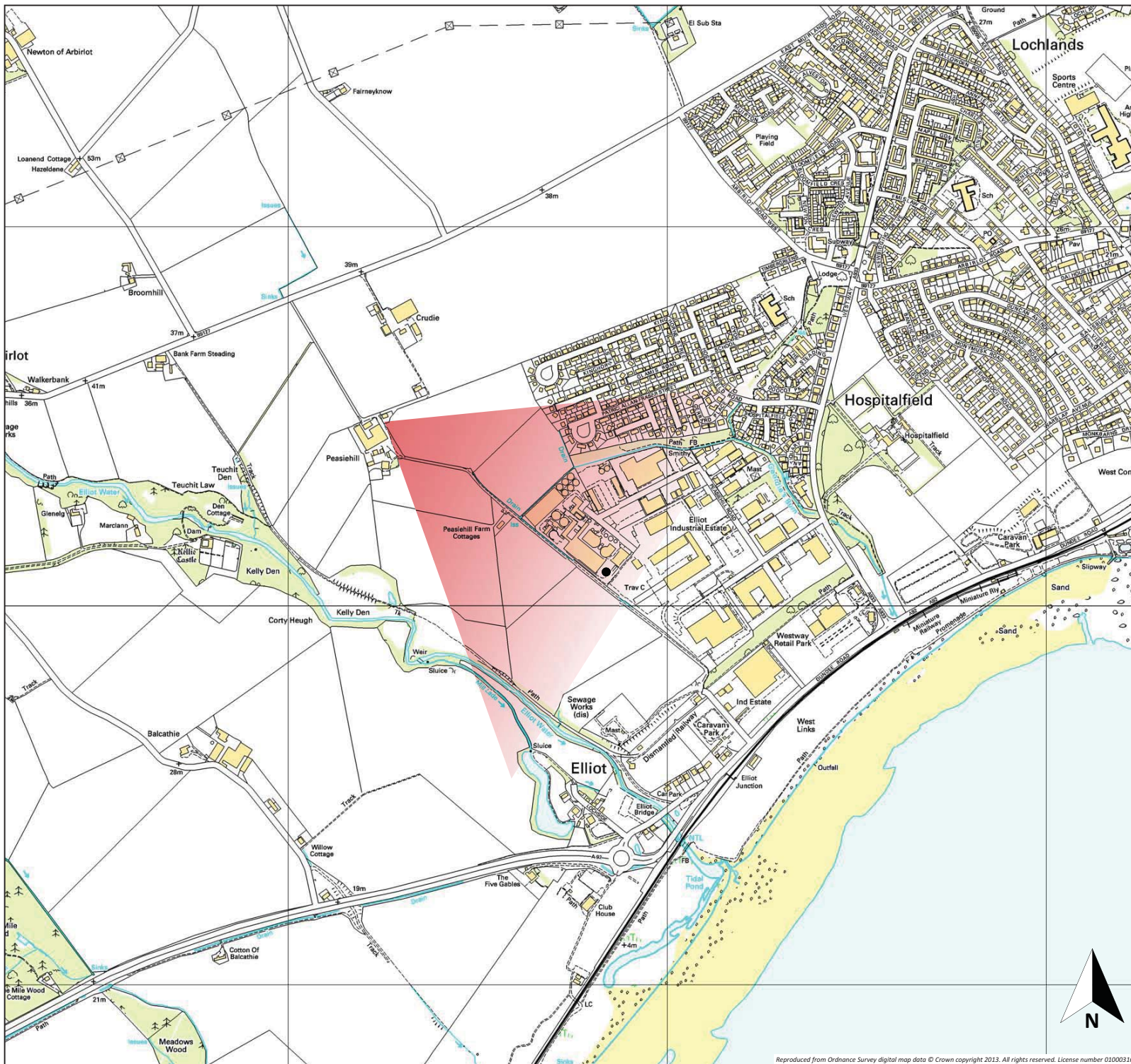
Checked by: RC

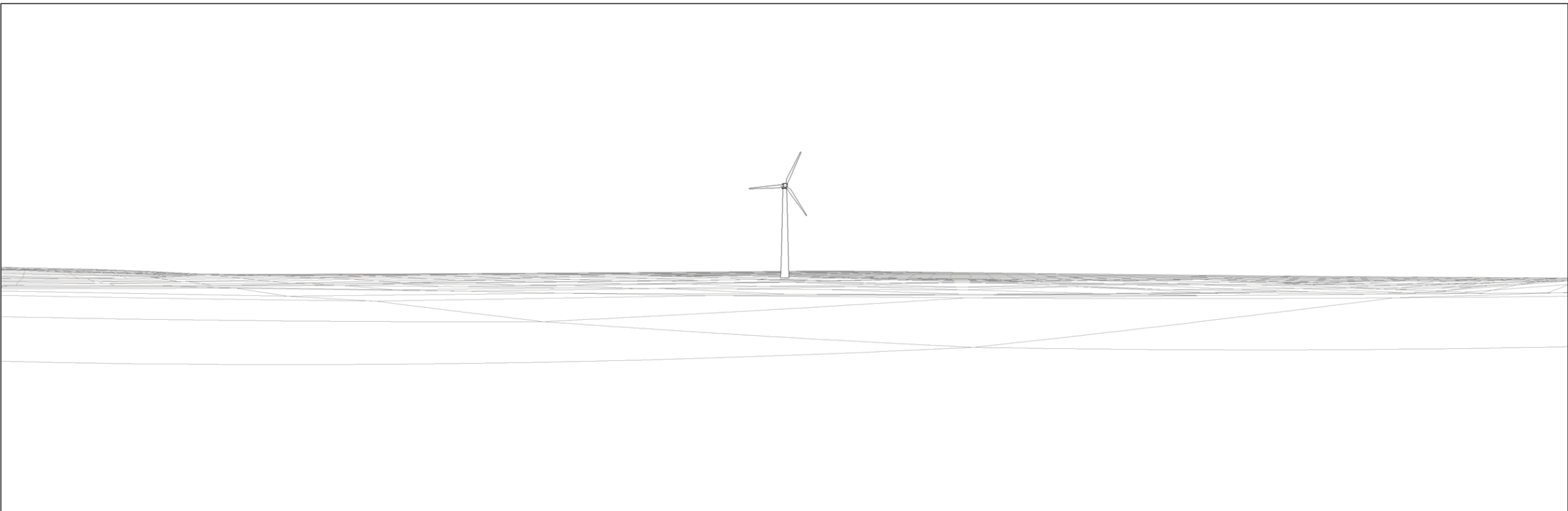
Approved By: GM

Date: 18/12/2014



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VP04 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine  
Document Title: VP05 - 71 Patrick Allan-Fraser Street

Scale: 1:10,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: **E361889 N740459**  
Viewpoint Elevation: **20m (A.O.D)**  
View Direction: **190°**  
Distance to Turbine: **370m**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
Focal Length: **35mm**  
Effective Focal Length: **54.6mm**  
Date Taken: **19/07/2013**  
Time Taken: **14:59**  
Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
Sensitivity: **Low**  
Overall: **Moderate**

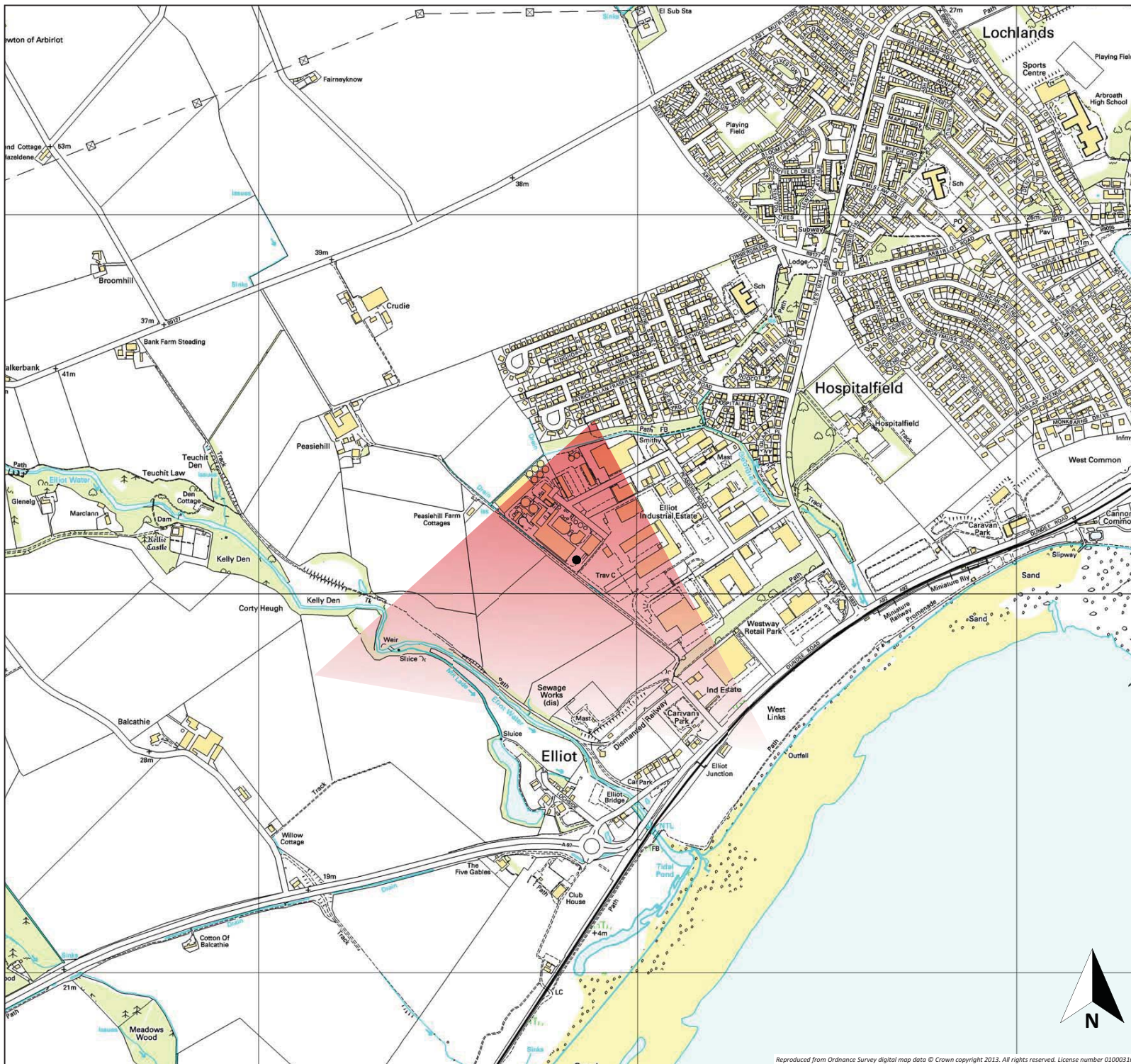
*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/App 2.3e**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **18/12/2014**



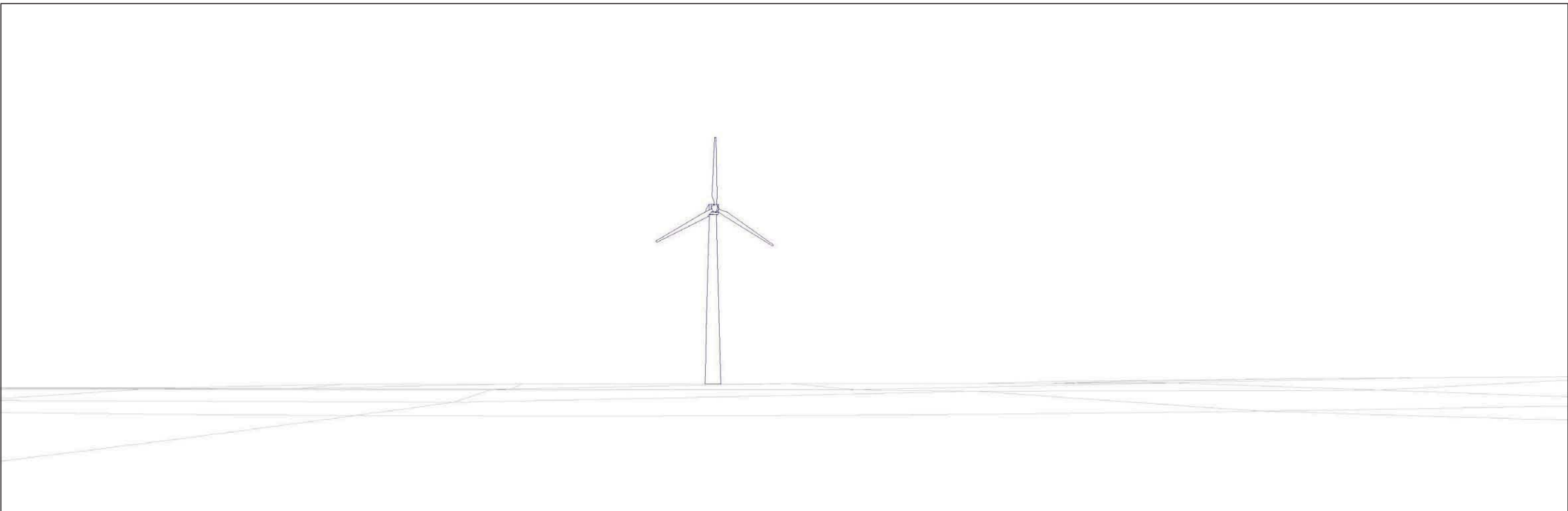


VP05 - PHOTOGRAPH OF EXISTING VIEW



AC205

VP05 - WIRELINE DRAWING



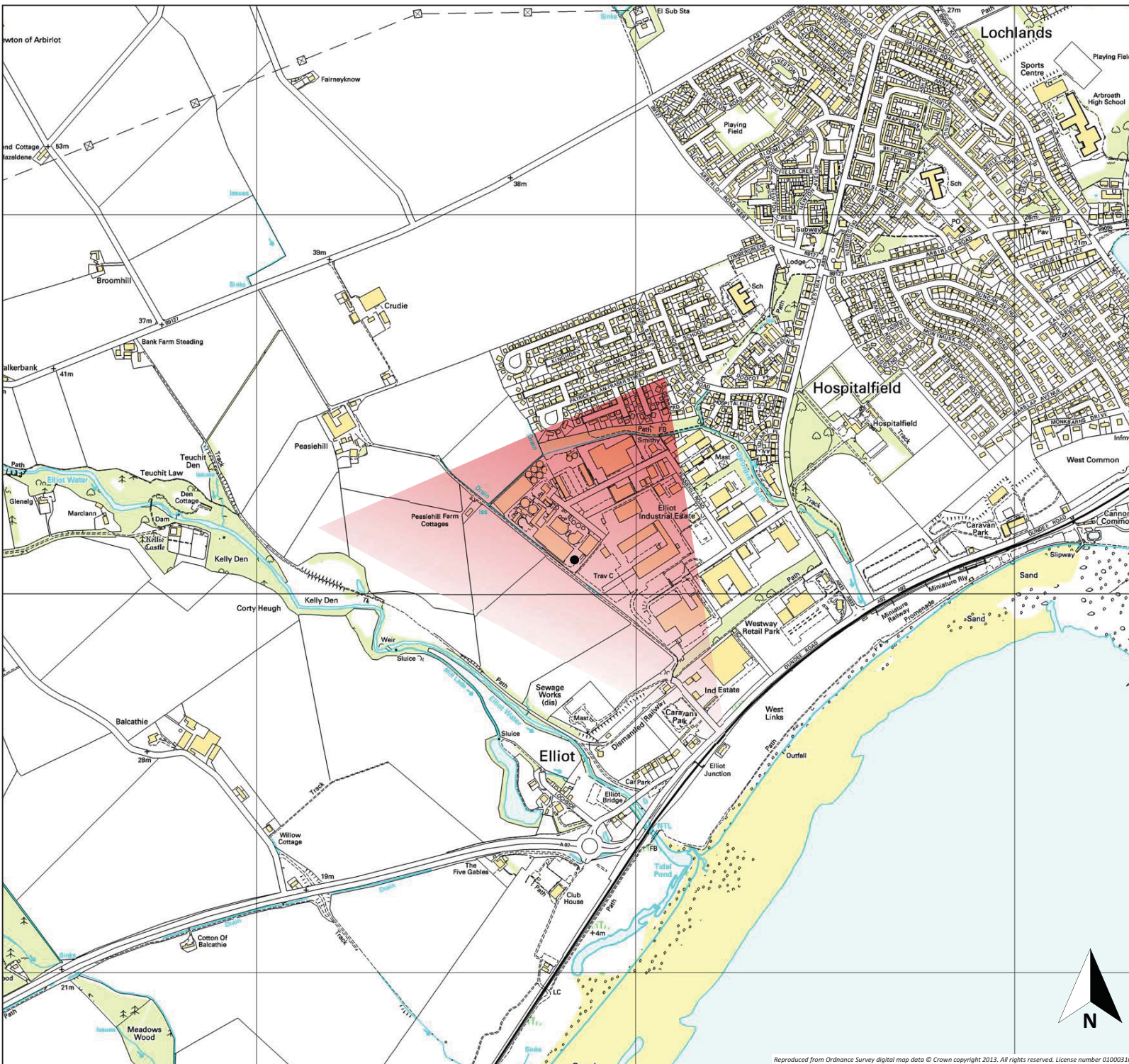


VP05 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE







Project Name: Bairds Malt Single Turbine  
 Document Title: VP06 - 5 Patrick Allan-Fraser Street

Scale: 1:10,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: **E362083 N740556**  
 Viewpoint Elevation: **19m (A.O.D)**  
 View Direction: **205°**  
 Distance to Turbine: **531m**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **19/07/2013**  
 Time Taken: **15:15**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Low**  
 Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



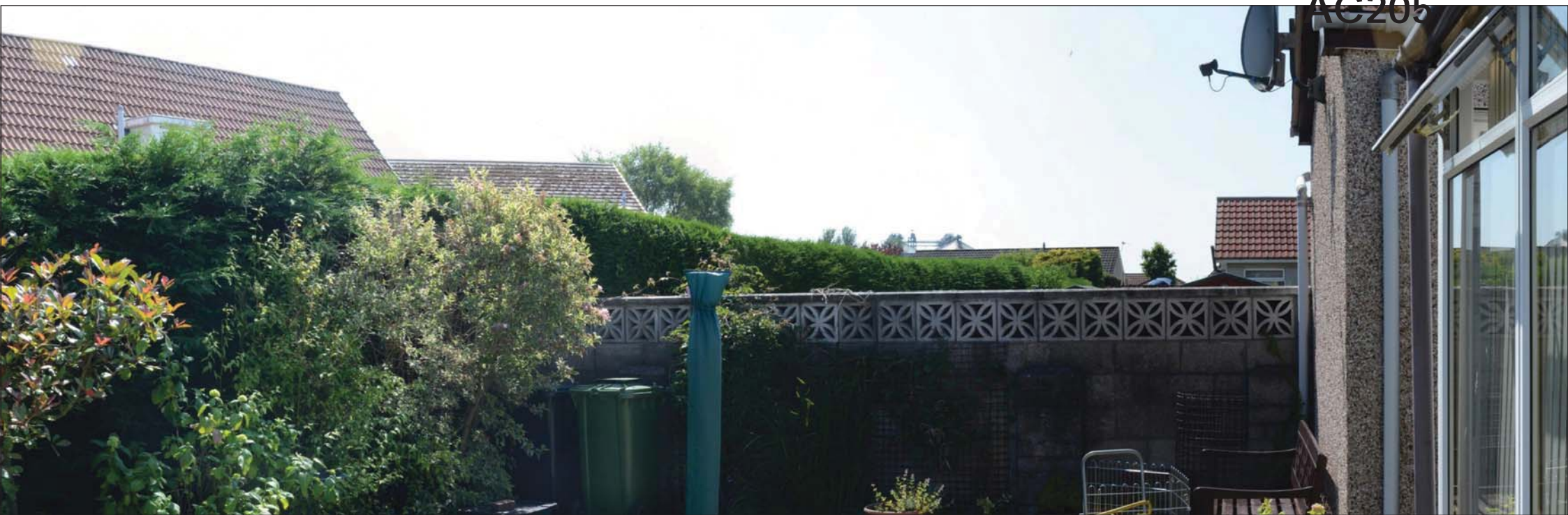
Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/App 2.3f**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **18/12/2014**





VP06 - PHOTOGRAPH OF EXISTING VIEW



VP06 - WIRELINE DRAWING

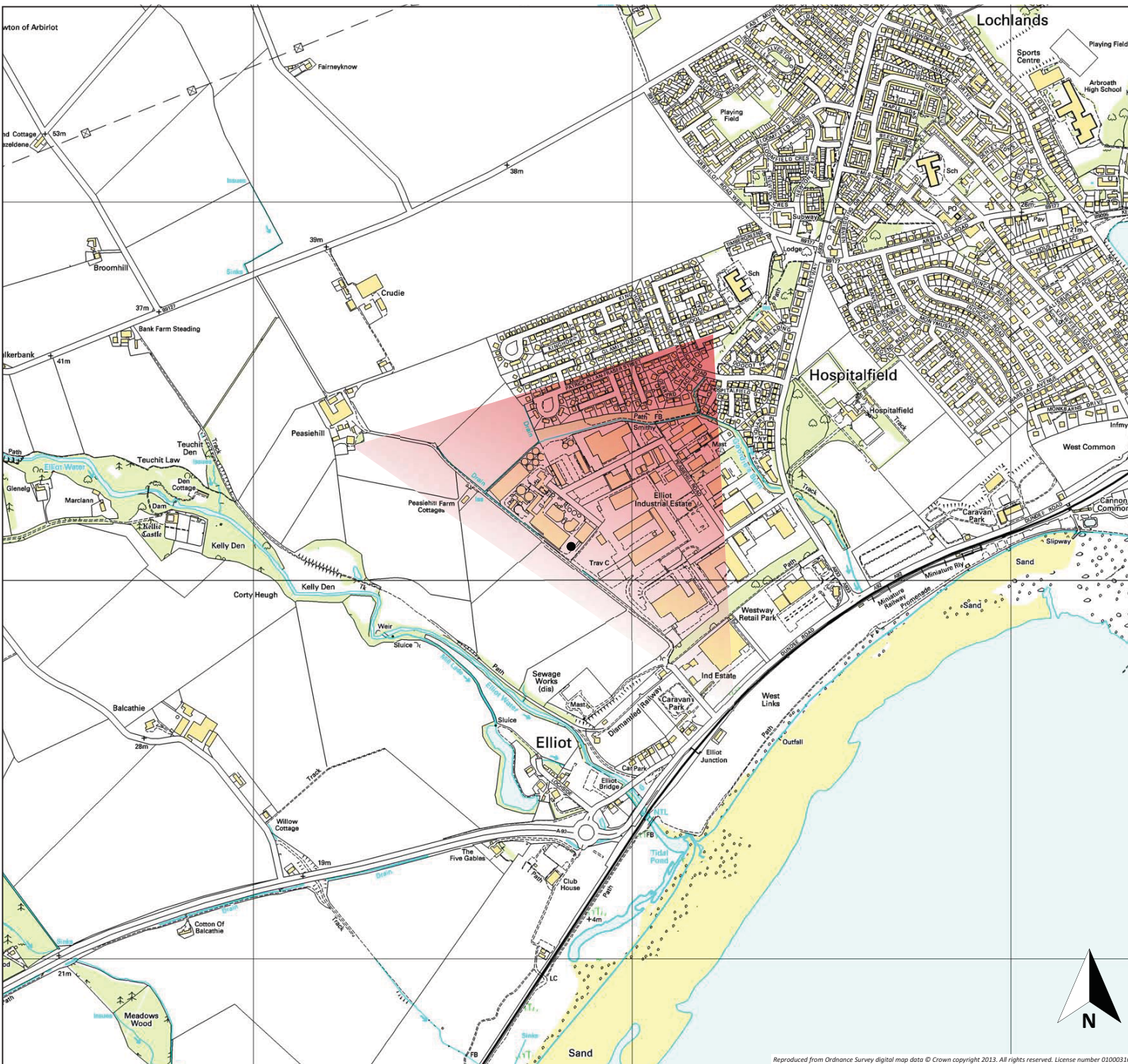


VP06 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE







Project Name: Bairds Malt Single Turbine  
 Document Title: VP07 - 24 School Road

Scale: 1:10,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76° Field of View

### Viewpoint Information

Viewpoint Location: **E362220 N740648**  
 Viewpoint Elevation: **20m (A.O.D)**  
 View Direction: **213°**  
 Distance to Turbine: **671m**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **19/07/2013**  
 Time Taken: **15:35**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Low**  
 Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/App 2.3g**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **18/12/2014**



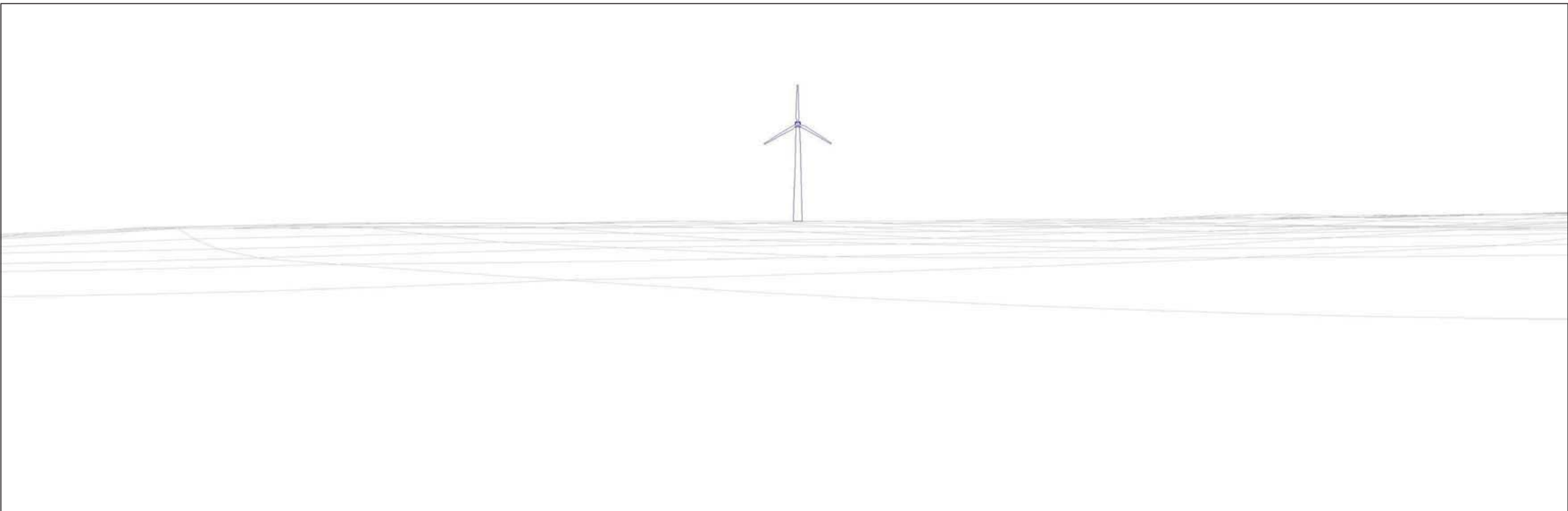


VP07 - PHOTOGRAPH OF EXISTING VIEW



AC205

VP07 - WIRELINE DRAWING





VP07 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



# BAIRDS MALT WIND TURBINE

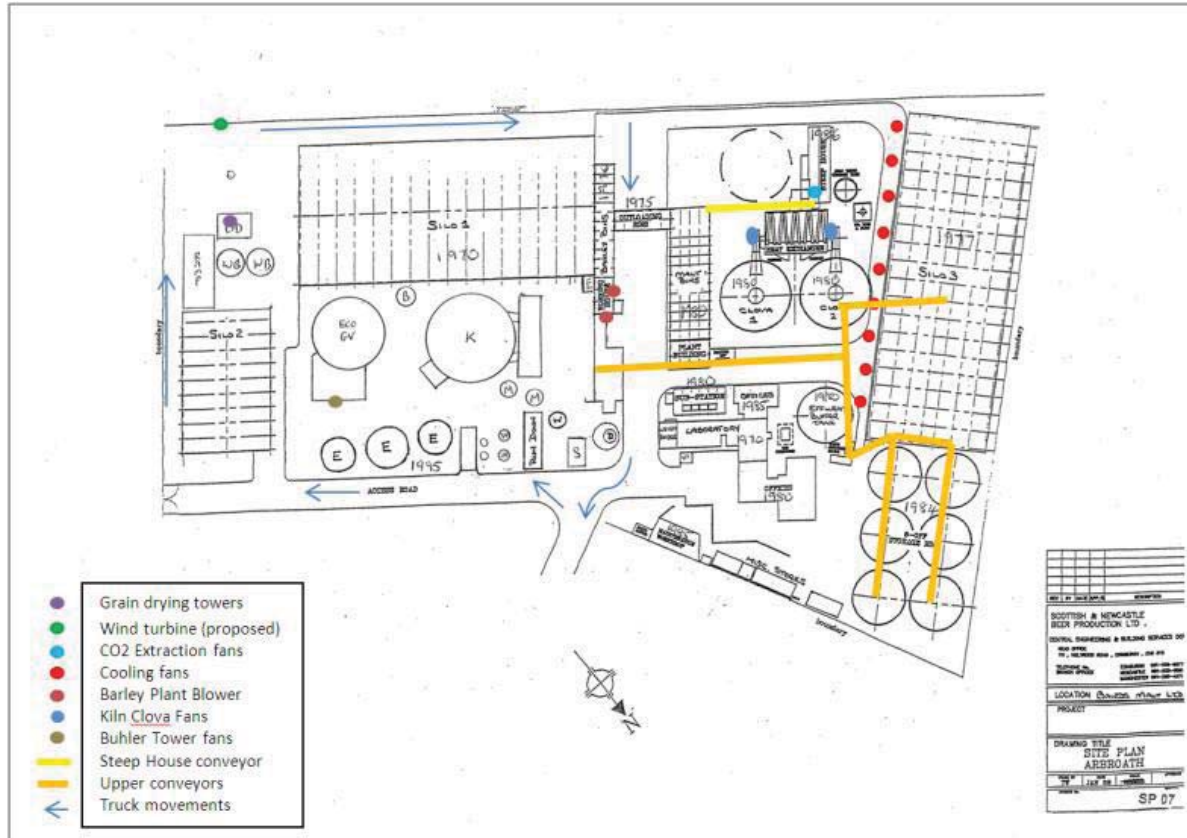
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## Appendix 3 – Noise

December 2014

## 1) On-site noise sources at Bairds Malt

Production activities at Bairds Malt have a both a weekly and a seasonal cycle. Error! Reference source not found. shows the location of the most significant sources of noise on-site at Bairds Malt.



**Primary noise sources at Bairds Malt**

These noise sources have the following normal patterns of use, shown below

Noise source	Normal pattern of operation
Grain Driers	September to mid-October (harvest season)
Steep House CO <sub>2</sub> extraction fans	Mon 19:00 – Tues 15:00. Tues 21:00-Weds 11:00. Thurs 14:00- Fri 02:00. Fri 06:00-Fri 12:00. Active throughout the year with the exception of September and October.
Silo 3 cooling fans	3 weeks in total (weather dependant) between end of October and early December.
Barley Plant blower	All day until between 22:00 & 23:00, 7 days per week
Steep House conveyor	Monday pm and Wednesday pm for 2 hours when required by Clova. Some occasional additional operation.
Upper conveyors	Very difficult to quantify, sometimes several hours per day, sometimes not for weeks at a time.
Kiln Clova Fans	When kilning: Mon 08:00 – Tues 22:00. Weds 08:00 – Thurs 22:00
Buhler Tower fans	24 hours per day, 7 days per week

**Patterns of use of noise sources**



# **BAIRDS MALT WIND TURBINE**

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## **Appendix 4.1 – Cultural Heritage Feature Table**

**December 2014**

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description		Theoretical Visibility	Comments
LB 1	21253	~0.8km	Hospitalfield	'A'	Large two and three-storey mansion house, Baronial, towered and turreted, ornate detail. Red sandstone and slate. 1840-70, incorporating mediaeval fragments. Interesting interiors. Built by Patrick Allan-Fraser on site of the Hospital of the Abbey.	Yes	The current setting of the baronial mansion is characterised by its location at the end of a tree lined access track and amongst the mature trees that comprise its immediate border. To the rear of the property lie the houses gardens and the urban area of Arbroath, to the north-west the residential area of Hospitalfield and to the south-west an industrial estate. The main façade of the house is oriented to the south-west with views across the industrial estate. There is an industrial estate in the predominant views from the houses main facade, adding an industrial element to the houses current setting. The telecommunications mast within the industrial estate adds a vertical aspect to the views to the south-west of the house.
LB 2	21252	~1.8km	Mortuary Chapel	'A'	Baronial, towered and turreted, ornate detail. Red sandstone. Built by Patrick Allan-Fraser. 1875.	Yes	The chapel is located within its associated graveyard. The immediate setting of the chapel is upon the north-westerly periphery of the town of Arbroath. The chapel has a more open setting to the west with views out across agricultural farmland in this direction.
LB 3	21254	~0.9km	Hospitalfield Fernery	'B'	Mock ruin containing plant house. Second half 19th cent.	Yes	The fernery is within the grounds of Hospitalfield mansion house. The fernery is located to the rear of the house, within the houses gardens. The wider setting of the fernery is surrounded by modern agricultural land with the built up, urban areas of Hospitalfield to the north-west and the town of Arbroath to the east.
LB 4	21257	~0.7km	Hospitalfield Doocot	'B'	Rectangular lean-to, rubble and slate with crow stepped flanks. 17th cent., remodelled second half 19th cent.	Yes	The doocot has theoretical views of the proposed project. The localised setting of the doocot is within the village of Hospitalfield. The surrounding buildings are expected to prevent long distance views of the development.
LB 5	21256	~0.8km	Hospitalfield Farm Building	'B'	Single-storey south front, rubble and slate, with Baronial centre piece. Mid-19th cent. and earlier.	Yes	The steading has theoretical views of the development. The localised setting of the steading is within the village of Hospitalfield. The surrounding buildings within the townscape are expected to prevent long distance views of the proposed turbine.
LB 6	21255	~0.9km	Hospitalfield - North Lodge	'B'	Two-storey gate house, Baronial, rubble and slate; depressed three-centre arch with oriel over, round corner tower and single-storey lodge. C.1860	Yes	The lodge has theoretical views of the project. The current setting of the lodge is upon the northern periphery of the village of Hospitalfield. The intervening townscape is expected to prevent long distance views in the direction of the proposed single turbine.



LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description		Theoretical Visibility	Comments
LB 7	4575	~1.0km	Kelly Castle	'B'	Four-storey tower-house L-plan, single-storey ranges enclosing small entrance court. Rubble and slate. Mainly 16 <sup>th</sup> and 17 <sup>th</sup> cents., restored about 1870.	Yes	The castles localised setting is within mature woodlands upon the southern bank of the Elliot Water. The main façade of the castle is orientated to the west south-west, across the castles associated courtyard. The wider setting of the castle is within modern agricultural farm land.
LB 8	4576	~1.2km	Kelly Castle- Doocot	'B'	Large rectangular gabled, harl and slate tabled skews. May date 17 <sup>th</sup> cent. But has been partially reconstructed.	Yes	The localised setting of the doocot is within mature woodland in the Kelly Castle grounds. The current setting of the doocot restricts long distance views either to or from the feature.
LB 9	4597	~1.7km	Arbirlot Parish Kirk Manse	'B'	Large two-storey, rubble and slate. 1835. Columned porch in re-entrant angle probably comes from another building. Good carved stone, north side. Thomas Guthrie lived here.	Yes	The localised setting of the manse is on the southern edge of the village of Arbirlot. The features immediate location within the village creates a rural community setting. The predominant views from the houses within the conservation area are into the surrounding buildings. The wider setting of the village is within modern agricultural farmland.
LB 10	4598	~1.7km	Arbirlot Bridge Over Elliot Water	'B'	Large single stilted semi-circular arch, ashlar, voussoirs with relief carvings. 19 <sup>th</sup> cent. Picturesque.	Yes	The bridge falls within the project's ZTV. The bridge spans the tree-lined Elliot Water. The bridge has a currently functional setting that allows a single track road to pass over the river. The proposed single turbine is not expected to adversely impact upon the bridges current setting or the way in which it is understood within the landscape.
LB 11	4592	~1.7km	Arbirlot Parish Kirk	'B'	Small cruciform, gothic with spired belfry. Rubble and slate. 1832. Bell dated 1655. Additions 1886.	Yes	The parish kirk is at the heart of the village of Arbirlot, providing a village setting. The kirk has theoretical views of the development.
LB 12	4595	~1.7km	Former School House	'B'	Plain single-storey cottage, colour washed rubble and slate, with symmetrical projecting wings, classic, pediments and venetian windows, which appear to	Yes	The immediate setting of the school house is on the eastern periphery of the village of Arbirlot.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description		Theoretical Visibility	Comments
					have been reconstructed from an earlier house. About 1830.		
LB 13	4593	~1.7km	Bridgeview	'B'	Plain single-storey cottages, rubble and slate. 19 <sup>th</sup> cent.	Yes	The current setting of the cottage is within the village of Arbirlot. The predominant views from the feature are into the surrounding village, there is the potential for the turbine to be visible in oblique views to the east.
LB 14	4594	~1.8km	Former Parish School	'B'	Small single-storey symmetrical with pedimented bay surmounted by belfry. White washed rubble and slate. About 1830. Now used as henhouse.	Yes	The current setting of the school is within the village of Arbirlot.
LB 15	4600	~1.8km	Denside House Doocot	'B'	Rectangular lean-to, rubble and corrugated iron. Inset stone (M.R.)P (17)47. Altered to toolshed.	Yes	The immediate setting of the doocot is on the western edge of the village of Arbirlot.
LB 16	4573	~1.7km	Millhill Mill	'B'	Two-storey mealmill, L-plan, rubble and slate, external wheel. Lintel dated 1719 and superscribed 1864. Detached bow-fronted kiln at higher level. Workings complete and in use up to ten years ago.	Yes	The current setting of the mill is upon the banks of the Elliot Water.
LB 17	21245	~1.9km	4&5 Gayfield	'B'	Two-storey classic double house, ashlar and slate with centre pedimented bay, pilastered, (antae), corners and doorpieces. C.1830. Later dormered attics	Yes	The immediate setting of the house is within the southern periphery of Arbroath. The locality of the house within the town of Arbroath characterises its urban setting. The current setting of the house is such that it is immediately adjacent to a modern road. The predominant views from the house are into the surrounding townscape.
LB 18	21240	~1.8km	Water Tower	'B'	Sham mediaeval, rusticated red sandstone walls with	Yes	The localised setting of the tower is within the Keptie conservation area. The listed buildings urban settings are expected to prevent long distance views in the direction of

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description		Theoretical Visibility	Comments
			Keptie Hill		towers and machicolated battlements. 1885. Wm. Gillespie Lamond, (of Friockheim), archt. Elevated site.		the proposed development.
LB 19	21239	~1.9km	Arbroath High School	'B'	Large two-storey U-plan Jacobean, rubble and slate; north front with projecting centre bay and end wings. C.1875. Carver and Symon, (of Arbroath), archts.	Yes	The localised setting of the school is within the Keptie conservation area. The listed buildings urban settings are expected to prevent long distance views in the direction of the proposed development.
LB 20	21237	~1.9km	St Margaret's Church	'B'	Aisled oblong with transepts and projecting porch, decorative Gothic, rubble and slate; south-east bell tower with crenellated and pinnacled parapet. 1877-79. Thomas S. Robertson, (of Dundee), archt.	Yes	The localised setting of the church is within the town of Arbroath. The urban setting of the church is such that the dominant views from the listed building are into the surrounding townscape. The surrounding buildings within the town of Arbroath are expected to prevent long distance views both to and from the church.
LB 21	21250	~2.1km	The Elms	'A'	Two-storey mansion house, French Gothic, rubble and slate with ashlar dressings; steep-pitched roof, arched porch and round corner tower. C.1869. Wm. Leiper, (of Glasgow), archt.	Yes	The localised setting of the house is within the town of Arbroath. The surrounding buildings within the town will prevent long distance views in the direction of the proposed development.
LB 22	21230	~2.2km	Ladyloan Bell Rock Lighthouse	'A'	1813. Classical and castellated group of twin lodges and signal tower. Painted stone. TOWER: engaged, 4-storey castellated tower rising from centre of piend-	Yes	The localised setting of the lighthouse is upon the southern periphery of Arbroath. The intervening buildings within the town are expected to screen views of the development at ground level. To the east the lighthouse has a more open setting with views out across the North Sea.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description		Theoretical Visibility	Comments
					roofed, 2-storey, 3-bay house.		
LB 23	21141	~2.5km	Dens Road, Baltic Works	'A'	1852 power loom linen weaving factory, ashlar and squared rubble-built. Slate roofs, Windows multi-paned sash and case, mostly now blocked.1. 4-storey 13-bay triple-pedimented Palladian frontage, pedimented sections slightly advanced and defined by quoins. 3-bay gables with die finials (one missing).	Yes	The current localised setting of the warehouse is such that it is situated in the heart of Arbroath where the intervening buildings within the town are expected to prevent long distance views of the proposed development.
SM 20/ LB 24	21133	~2.7km	Arbroath Abbey- Regality Tower	'A'	Square keep, three-storey with vaulted floors and corbelled parapet; formed N.W. corner of Abbey precincts adjoining the regality courthouse. 13 <sup>th</sup> century.	Yes	The immediate setting of the Abbey and its associated buildings within the Abbey grounds. The current setting of the Abbey grounds is within the heart of Arbroath. The predominant views from the abbey itself are into the surrounding townscape.
SM 20/ LB 25	21132	~2.7km	Arbroath Abbey- pend	'A'	Fortified gatehouse, with remains of groined roof. Corbel course at upper floor level over archway: formerly defended by portcullis. 15 <sup>th</sup> century.	Yes	The immediate setting of the Abbey and its associated buildings within the Abbey grounds. The current setting of the Abbey grounds is within the heart of Arbroath. The predominant views from the abbey itself are into the surrounding townscape.
SM 20/ LB 26	21134	~2.7km	Arbroath Abbey- Abbot's House	'A'	Three-storey with groined roof to ground floor. Parts dating 13 <sup>th</sup> century. Best example of its kind remaining in Scotland and now preserved as a	Yes	The immediate setting of the Abbey and its associated buildings within the Abbey grounds. The current setting of the Abbey grounds is within the heart of Arbroath. The predominant views from the abbey itself are into the surrounding townscape.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
				museum.		
SM 20/ LB 27	21131	~2.7km	Arbroath Abbey- Conventual Building	'A' Two-storey remains of west range forming part of enclosure to Abbey precincts. 13 <sup>th</sup> century	Yes	The immediate setting of the Abbey and its associated buildings within the Abbey grounds. The current setting of the Abbey grounds is within the heart of Arbroath. The predominant views from the abbey itself are into the surrounding townscape.
SM 20/ LB 28	21130	~2.7km	Arbroath Abbey- Abbey Church and Precincts	'A' Red sandstone ruin. Cruciform plan with aisleless presbytery, transeptal chapels and twin towers with great western doorway. Royal foundation dedicated by William the Lion to St. Thomas of Canterbury in 1176. Assembly of Nation issued declaration of Arbroath here in 1320	Yes	The immediate setting of the Abbey and its associated buildings within the Abbey grounds. The current setting of the Abbey grounds is within the heart of Arbroath. The predominant views from the abbey itself are into the surrounding townscape.
LB 29	4770	~3.4km	St. Vigeans Parish Kirk	'A' Aisled oblong with west tower and polygonal apse as restored in 1871 by Sir R. Rowand Anderson, arch. Incorporates 12 <sup>th</sup> cent. Gables, 15 <sup>th</sup> cent. Tower and arcading and Celtic stones built into the fabric. Picturesque and elevated site.	No	The parish kirk falls outwith the proposed developments ZTV. The localised setting of the kirk is upon the banks of the Brothock Water, immediately adjacent to a railway line. The current localised setting of the kirk is not expected to be adversely impacted by the proposed development.
SM 1	6648	~1.1km	Peasiehill, souterrains	The monument comprises the remains of two souterrains of later prehistoric date represented by cropmarks visible in oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 2	7072	~1.8km	Grahamston	The monument comprises two	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
			Cottages, souterrains	souterrains of later prehistoric date, visible as cropmarks on oblique aerial photographs.		setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 3	7071	~1.9km	Cotton of Balcathie, unenclosed settlement	The monument comprises an unenclosed settlement of prehistoric date, visible as a series of cropmarks on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 4	7068	~2.1km	Cotton of Balcathie, unenclosed settlement	The monument comprises an unenclosed settlement of prehistoric date, visible as a series of cropmarks on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 5	6622	~2.2km	Mains of Kelly, enclosures and souterrain	The monument comprises the remains of two enclosed settlements and a souterrain of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 6	6623	~2.5km	Nether Kelly, ring ditch	The monument comprises the remains of a ring ditch house of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 7	6624	~2.8km	Nether Kelly, unenclosed settlement	The monument comprises the remains of an unenclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 8	6618	~4.2km	Hatton House, ring ditches	The monument comprises the remains of two ring ditch houses of prehistoric date represented by cropmarks visible on oblique aerial	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.



LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
				photographs.		
SM 9	6617	~4.1km	Hatton Farm, unenclosed settlement	The monument comprises the remains of an unenclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 10	6616	~4.4km	East Scryne, souterrain	The monument comprises the remains of a souterrain of later prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 11	6615	~4.7km	East Scryne Hall, rectangular enclosure	The monument comprises the remains of a sub-rectangular enclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 12	6621	~2.4km	Mains of Kelly, enclosure	The monument comprises the remains of a sub-rectangular enclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 13	6619	~2.7km	Mains of Kelly, souterrain	The monument comprises the remains of a souterrain of later prehistoric date represented by cropmarks visible on aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 14	6619	~2.9km	Mains of Kelly, souterrain	The monument comprises the remains of a souterrain of later prehistoric date represented by cropmarks visible on aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
SM 15	6625	~3.3km	Kellyfield, palisaded enclosure	The monument comprises the remains of a palisaded enclosure of prehistoric date represented by cropmarks visible on oblique aerial photographs.	Yes	This feature survives as cropmarks visible on oblique aerial photographs. The current setting of each the feature is within modern agricultural fields subject to intense agricultural practices.
SM 16	6649	~4.0km	David's Hill, enclosure	The monument comprises the remains of an enclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs.	No	The current setting of the SM is within mature woodland that will prevent long distance views either to or from the feature.
SM 17	90272	~3.4km	St Vigean's Museum, symbol stones	Cottages now used as museum, containing a large and most important collection of sculptured stones formerly re-used within the church buildings or displayed within the church. The stones were moved and restored in 1960 by the Ministry of Works.	No	The current localised settings of the stones are within the St Vigean's Museum. The current setting of the stones is not expected to be adversely impacted by the proposed single turbine.
SM 18	6641	~3.3km	Souterrain, Eastern Cemetery, Arbroath	The monument is part of a stone-lined souterrain of the later Iron Age, in use probably between around 250 BC and AD 400. It was discovered in 1932 and partially excavated, but was filled in during the 1990s.	Yes	The localised setting of the souterrain is within a cemetery on the northern periphery of Arbroath. The buildings within the intervening townscape are predicted to prevent long distance views of the proposed development.
SM 19	2874	~4.9km	Dickmount Law, cairn	A large, flat-topped cairn, situated on the top of Dickmount Law and surrounded at base by a modern retaining wall. It measures about 30m overall and is 3m high, the flat top being 12m in diameter and showing signs of excavation.	Yes	The localised setting of the cairn is upon a modern field boundary. The intervening townscape of Arbroath is expected to prevent long distance views in the direction of the single turbine.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
SM 20/ LB 24- 28	90018	~2.7km	Arbroath Abbey and associated buildings	The monument comprises the remains of Arbroath Abbey and associated buildings. It is in the care of the Secretary of State for Scotland and is being re-scheduled to clarify the extent of the protected area.	Yes	The current setting of the abbey is with the heart of the town of Arbroath. The immediate setting of the abbey is encompassed by the surrounding buildings within Arbroath. The localised setting of the historic feature is such that the surrounding buildings will prevent long distance views at ground level.
SM 21	145	~1.8km	Arbirlot, carved stone	The monument is a medieval carved stone, likely to date to between AD 850 and 1600. It is an undressed block of whinstone set vertically in the ground and measures about 1.70m high by 0.85m wide.	Yes	The current localised setting of the SM is within the village of Arbirlot. The surrounding houses within the town are expected to prevent long distance views both to and from the craved stone.
CA 1	N/A	~1.6km	Arbroath Keptie Pond	The conservation area covers the Keptie Pond area in Arbroath. The conservation area is bordered by roads to the north and east and the by the surrounding town to the west. The conservation area is located in the heart of Arbroath.	Yes	The full extent of the conservation area has theoretical views of the proposed development. The conservation area spans the Kepie Pond area within the town of Arbroath. The Kepie Pond lies in the north-western area of the conservation area. The conservation area is bordered by roads to the north and east and by the adjacent built up area within Arbroath to the west.
CA 2	N/A	~1.6km	Arbirlot	The conservation area covers the entirety of the village of Arbirlot. The tree-lined Elliot Water runs through the heart of the conservation area.	Yes	The Arbirlot conservation area is a small village upon the banks of the Elliot Water. The conservation area spans the entirety of the village of Arbirlot. The design of the conservation area is such that the predominant views from the feature are into the conservation area itself. The wider setting of the conservation area is within modern agricultural land ~2km to the west of Arbroath.

LB/SM/ GDL no.	HBNUM/ Index no.	Distance from turbine	Name	Listing & Description	Theoretical Visibility	Comments
GDL 1	N/A	~4.3km	The Guynd	An attractive 19th century parkland and woodland landscape providing the setting for a classical mansion house and other interesting architectural features. Earlier estate plans by James Abercrombie (1775) and Thomas White (1799) exist but were not implemented for more than 100 years. Date of Inclusion: 1987. The gardens have been categorised as 'High' for Architectural and Nature Conservation.	Yes	The gardens are bordered by mature woodlands to the; east, south and west. The gardens mature woodland borders restrict long distance views from the GDL itself. The GDLs associated 'B' listed; 19 <sup>th</sup> century mansion house is located in the western section of the gardens. The GDL is bound by the B9127 to the north. Modern agricultural fields lie at the heart of the gardens. The Elliot Water flows through the southern periphery of the gardens.

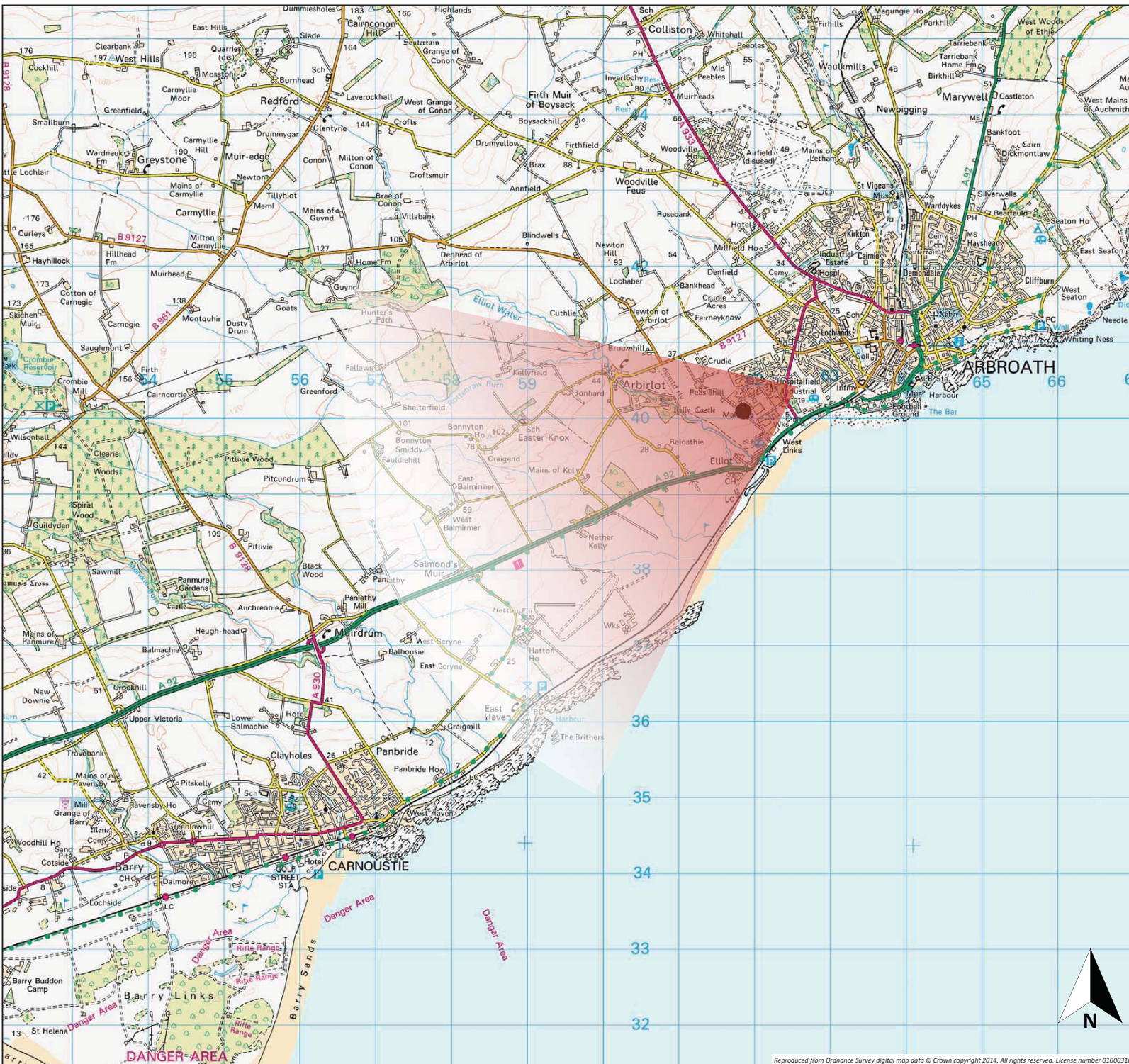
# **BAIRDS MALT WIND TURBINE**

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## **Appendix 4.2 – Cultural Heritage Graphics**

**December 2014**

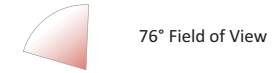




Project Name: Bairds Malt Wind Turbine  
 Document Title: VP01 - Hospital Field (Tower)

Scale: 1:50,000 @ A3

Key: ● Proposed Turbine Location



76° Field of View

### Viewpoint Information

Viewpoint Location: **E362569 N740438**  
 Viewpoint Elevation: **38m (A.O.D)**  
 View Direction: **244°**  
 Distance to Turbine: **802m**

Visibility: **1 Nacelle**

Camera Type: **Nikon D3000**  
 Focal Length: **35mm**  
 Effective Focal Length: **53.34mm**  
 Date Taken: **21/01/14**  
 Time Taken: **10:00**  
 Height above elevation: **1.5m**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

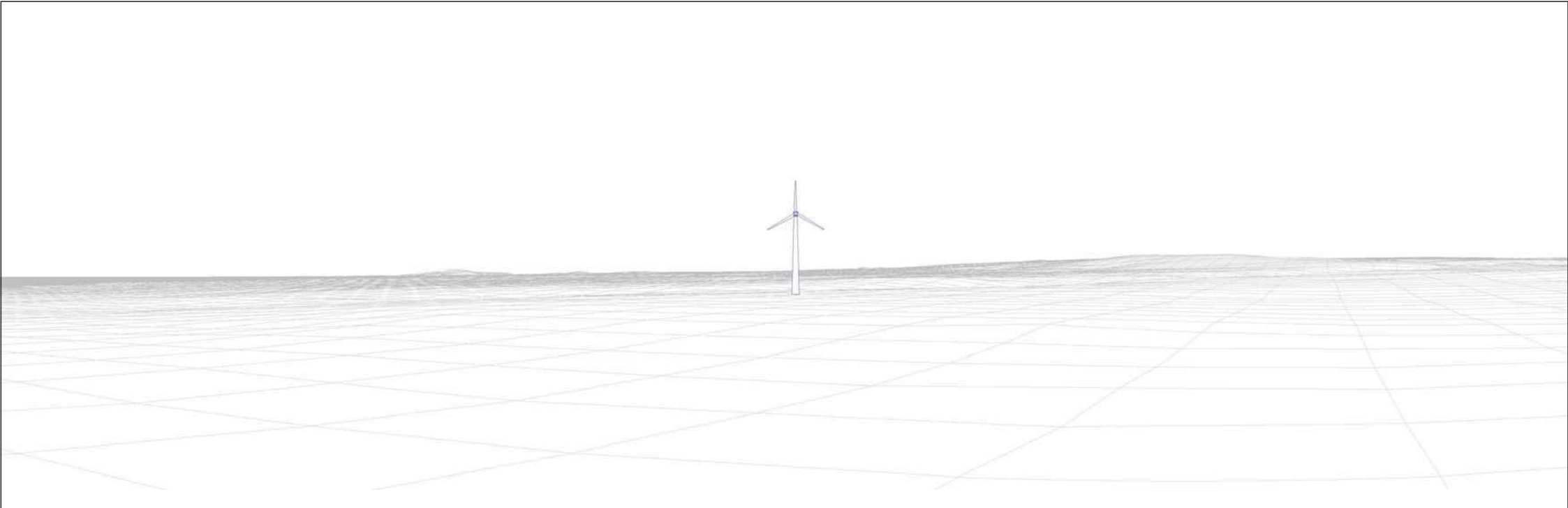
Client: Bairds Malt Single turbine Ltd

Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/Fig 9.1**  
 Version: **1.0**  
 Author: **BC**  
 Checked by: **RS**  
 Approved by: **GM**  
 Date: **22/01/14**







VP01 HOSPITAL FIELD (TOWER) - PHOTOMONTAGE OF PROPOSAL

76 VIEWING ANGLE  
300MM VIEWING DISTANCE





Project Name: Bairds Malt Wind Turbine  
Document Title: VP02 - Hospital Field (Grounds)

Scale: 1:50,000 @ A3

Key: ● Proposed Turbine Location



76° Field of View

### Viewpoint Information

Viewpoint Location: **E362518 N740412**  
Viewpoint Elevation: **15m (A.O.D)**  
View Direction: **234°**  
Distance to Turbine: **745m**

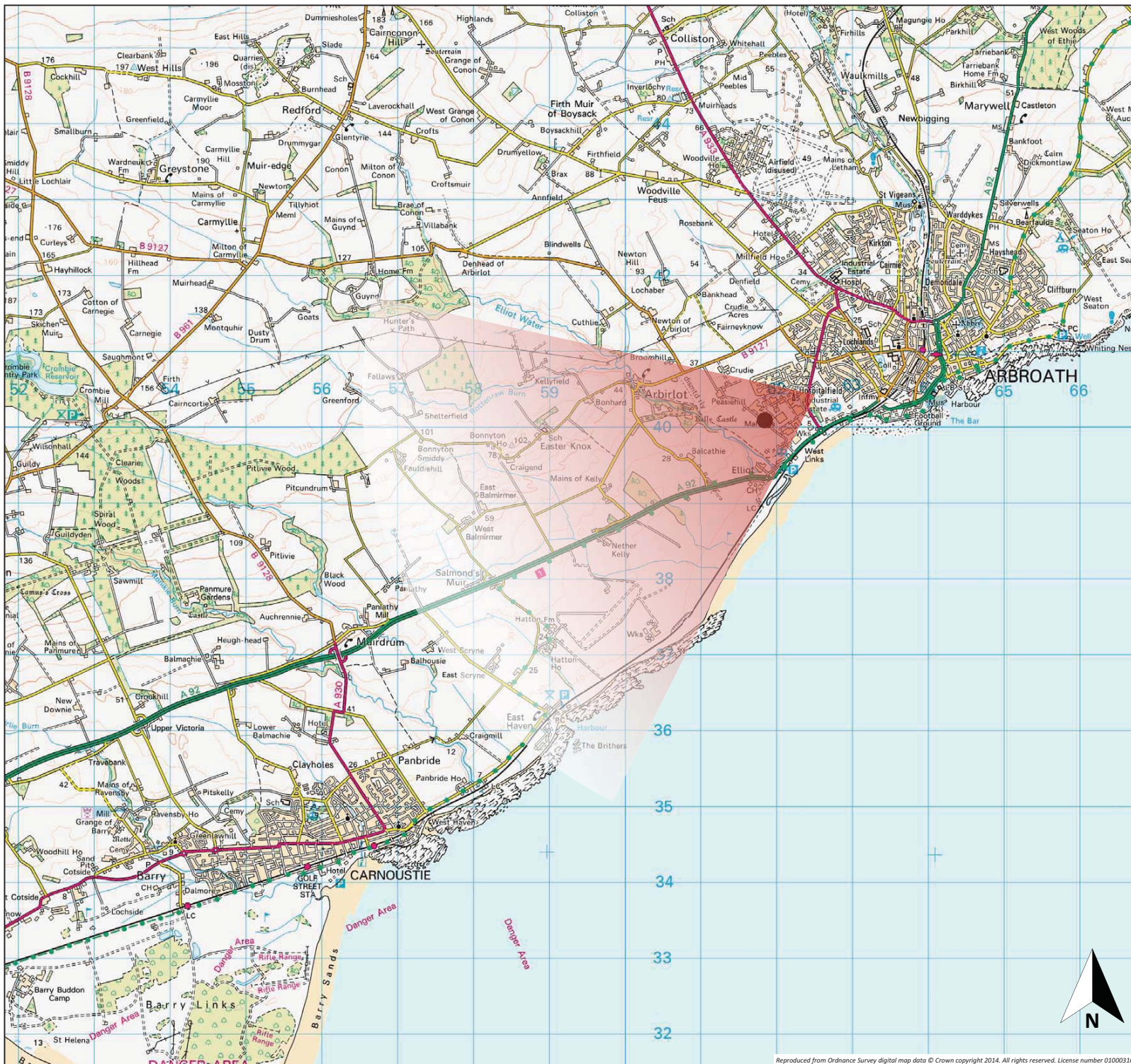
Visibility: **1 Nacelle**

Camera Type: **Nikon D3000**  
Focal Length: **35mm**  
Effective Focal Length: **53.34mm**  
Date Taken: **21/01/14**  
Time Taken: **10:45**  
Height above elevation: **1.5m**

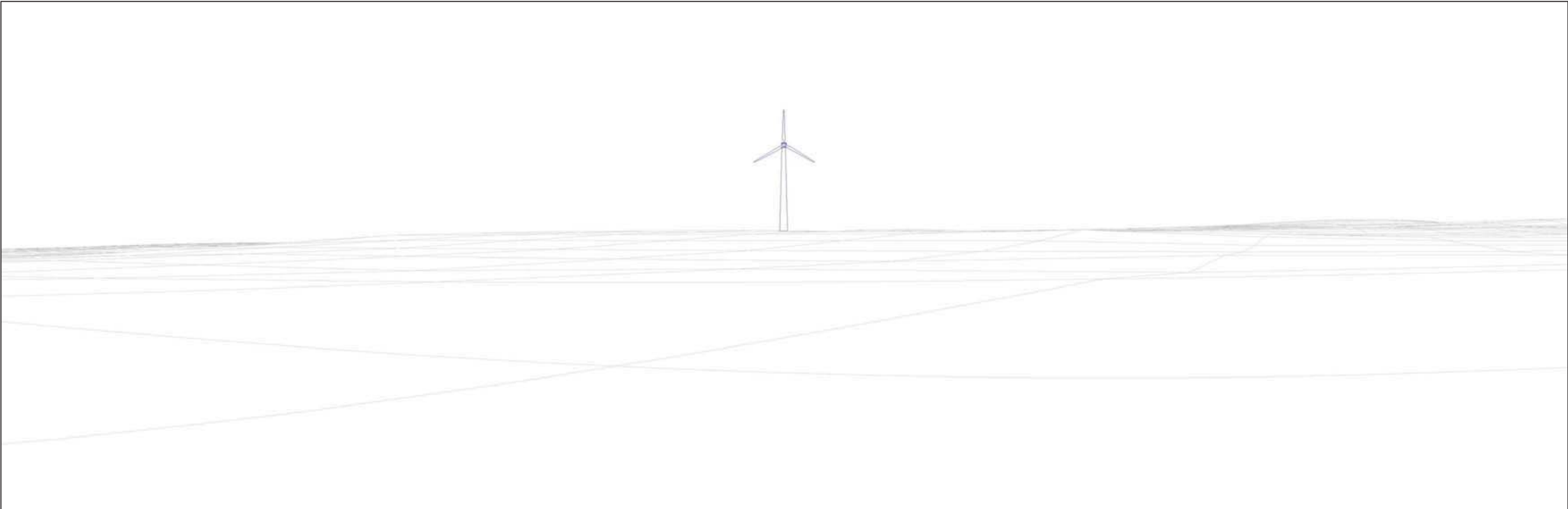
*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single turbine Ltd  
Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/Fig 9.2**  
Version: **1.0**  
Author: **BC**  
Checked by: **RS**  
Approved By: **GM**  
Date: **22/01/14**







VP02 HOSPITAL FIELD (GROUNDS) - PHOTOMONTAGE OF PROPOSAL

76 VIEWING ANGLE  
300MM VIEWING DISTANCE






Project Name: Bairds Malt Wind Turbine  
Document Title: VP03 - Hospital Field (A92)

Scale: 1:50,000 @ A3

Key:

- Proposed Turbine Location
-  76° Field of View

### Viewpoint Information

Viewpoint Location: **E362851 N740071**  
Viewpoint Elevation: **3m (A.O.D)**  
View Direction: **338°**  
Distance to Turbine: **1.0km**

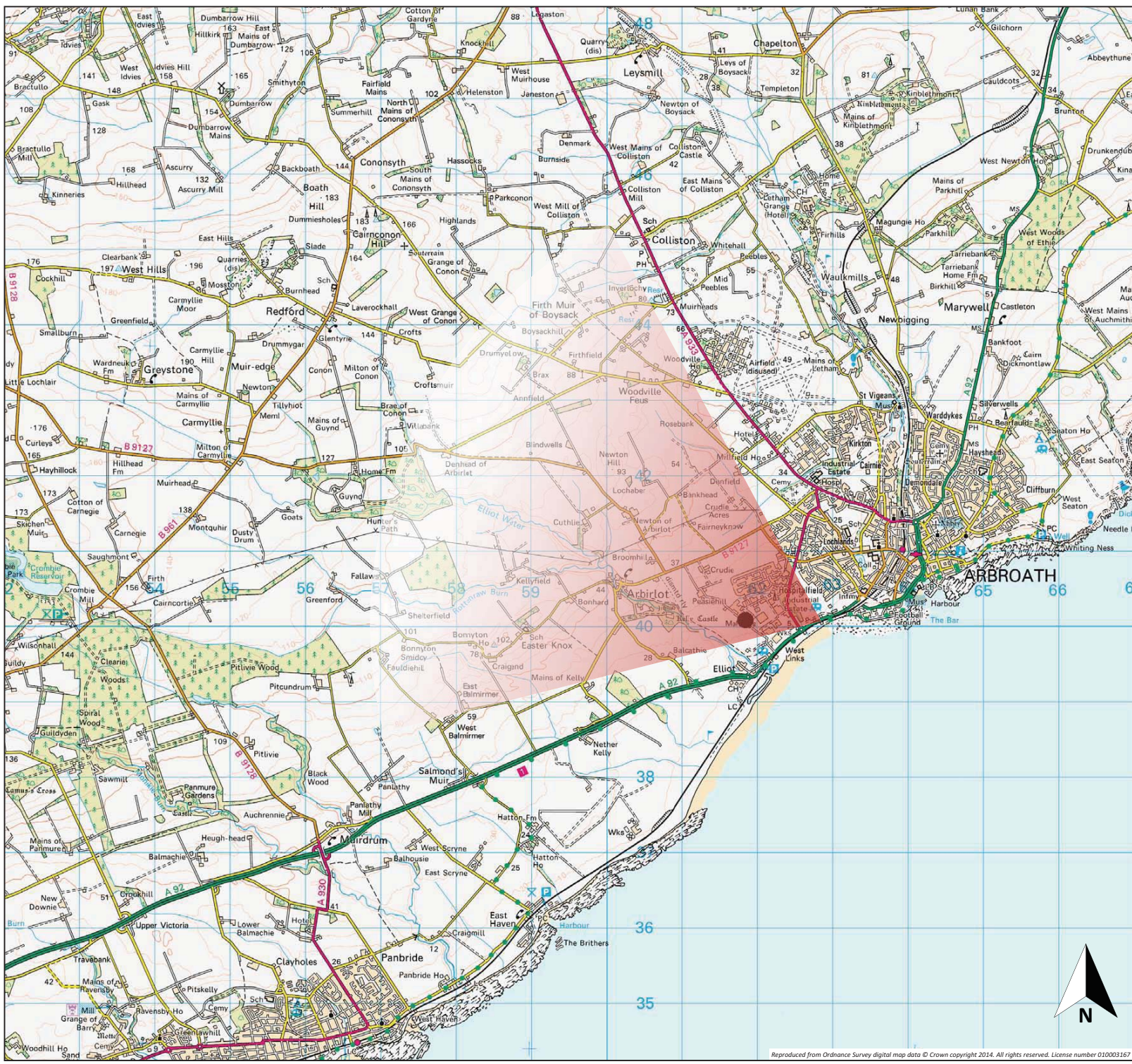
Visibility: **1 Nacelle**

Camera Type: **Nikon D3000**  
Focal Length: **35mm**  
Effective Focal Length: **53.34mm**  
Date Taken: **21/01/14**  
Time Taken: **12:05**  
Height above elevation: **1.5m**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single turbine Ltd  
Drawing by: Green Cat Renewables Ltd

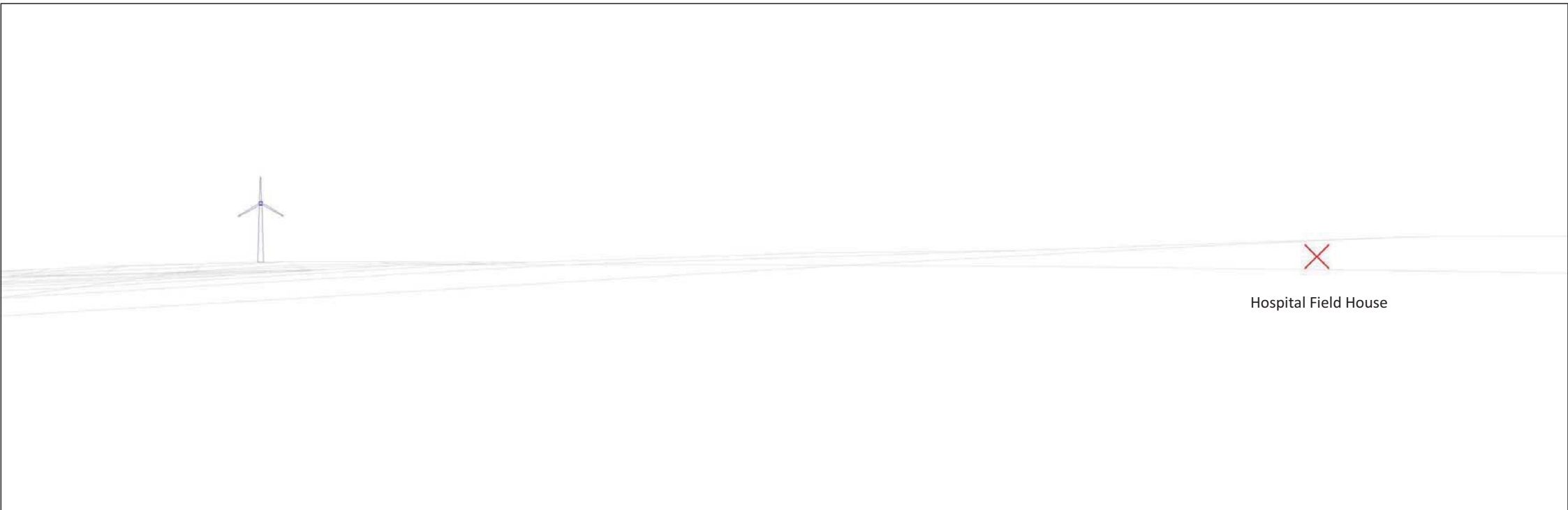
Document Number: **C0621-163/Fig 9.3**  
Version: **1.0**  
Author: **BC**  
Checked by: **RS**  
Approved By: **GM**  
Date: **22/01/14**







VP03 HOSPITAL FIELD (A92) - WIRELINE DRAWING



VP03 HOSPITAL FIELD (A92) - PHOTOMONTAGE OF PROPOSAL

76 VIEWING ANGLE  
300MM VIEWING DISTANCE

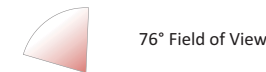




Project Name: Bairds Malt Wind Turbine  
Document Title: VP04 - Hospital Field (Arbirlot Road)

Scale: 1:50,000 @ A3

Key: ● Proposed Turbine Location



### Viewpoint Information

Viewpoint Location: E361092 N739292  
Viewpoint Elevation: 19m (A.O.D)  
View Direction: 35°  
Distance to Turbine: 1.1m

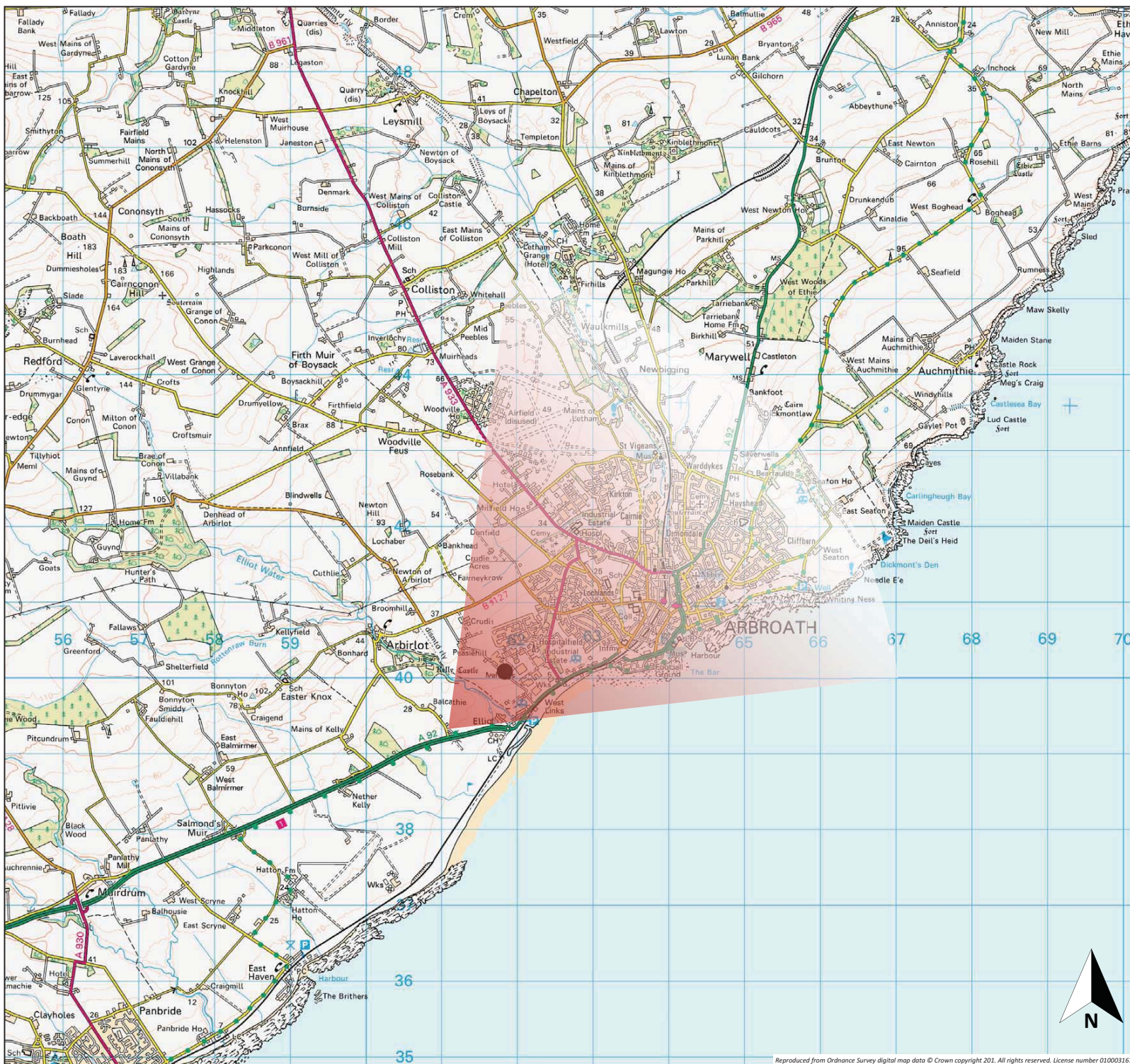
Visibility: 1 Nacelle

Camera Type: D3000  
Focal Length: 35mm  
Effective Focal Length: 53.34mm  
Date Taken: 21/01/14  
Time Taken: 12:45  
Height above elevation: 1.5m

Please note for a 76° field of view, a viewing distance of 300mm is recommended.

Client: Bairds Malt Single turbine Ltd  
Drawing by: Green Cat Renewables Ltd

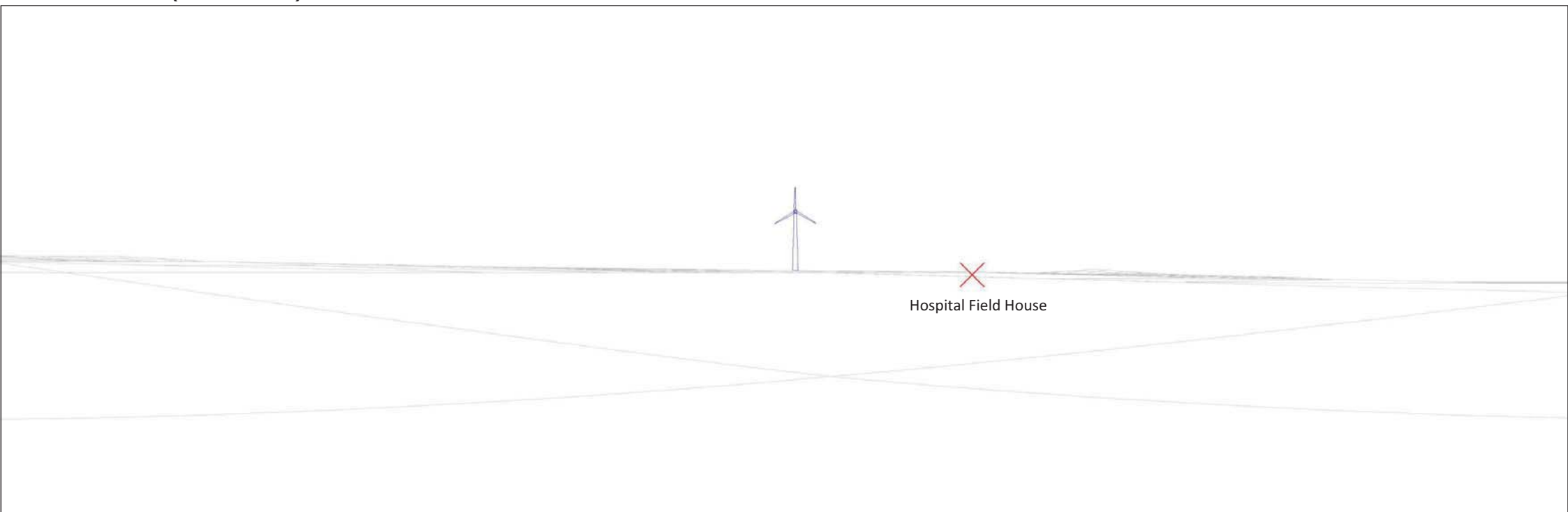
Document Number: C0621-163/Fig 9.4  
Version: 1.0  
Author: BC  
Checked by: RS  
Approved By: GM  
Date: 22/01/14







VP04 HOSPITAL FIELD (ARBIRLOT ROAD) - WIRELINE DRAWING



VP04 HOSPITAL FIELD (ARBIRLOT ROAD) - PHOTOMONTAGE OF PROPOSAL

76 VIEWING ANGLE  
300MM VIEWING DISTANCE












# **BAIRDS MALT WIND TURBINE**

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## **Appendix 5 – Shadow Flicker Screening Map**

**December 2014**

Project Name: **Baird Malt Single Turbine**  
 Document Title: **Shadow Flicker Assessment - Area of Influence and Assessed Properties**  
 Scale: **Not to Scale**

- Key:
-  Proposed Wind Turbine Location
  -  10RD (440m) from Wind Turbine
  -  Area of Theoretical Shadow Flicker > 30hrs per annum\*
  -  Assessed Properties
  -  Industrial
  -  Commercial within Industrial
  -  Facade with windows potentially affected by Shadow Flicker

- |                             |                       |
|-----------------------------|-----------------------|
| 1. Peasiehill Farm Cottages | Residential           |
| 2. PAF 1                    | Residential           |
| 3. PAF 2                    | Residential           |
| 4. PAF 3                    | Residential           |
| 5. PAF 4                    | Residential           |
| 6. SRCL                     | Industrial            |
| 7. Tayside Door Factory     | Industrial            |
| 8. Elliott Buisness Park    | Industrial/Commercial |
| 9. Smithy                   | Industrial            |
| 10. Mackays                 | Industrial            |
| 11. NEWDWES Self Storage    | Industrial            |
| 12. Halliburton 1           | Industrial            |
| 13. Halliburton 2           | Industrial            |
| 14. Halliburton 3           | Industrial/Commercial |
| 15. Energy Alloys           | Industrial/Commercial |
| 16. Massstock               | Industrial/Commercial |
| 17. Buildbase               | Industrial/Commercial |
| 18. Halliburton 4           | Industrial/Commercial |
| 19. PMP Interplex           | Industrial/Commercial |

\* This is indicative only and will vary slightly depending on the number of windows, orientation etc.

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Client: **Bairds Malt Single Turbine Ltd**  
 Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **GM**  
 Approved By: **GM**  
 Date: **17/02/2014**

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# **BAIRDS MALT WIND TURBINE**

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## **Appendix 6 – Socio-Economic Report**

**December 2014**



# Socio-Economic Impact Assessment of Proposed Renewables Development - Bairds Malt, Angus

Final Report for Bairds Malt and the Kilmac  
Group

July 2014

EKOS Limited, St. George's Studios, 93-97 St. George's Road, Glasgow, G3 6JA  
Reg 145099

Telephone: 0141 353 1994

Web: [www.ekos-consultants.co.uk](http://www.ekos-consultants.co.uk)

Direct enquiries regarding this report should be submitted to:

**Chris Kelly, Senior Consultant, EKOS**

Email: [chris.kelly@ekos.co.uk](mailto:chris.kelly@ekos.co.uk)

Tel: 0141 353 8316

 As part of our green office policy all EKOS reports are printed double sided on 100% sustainable paper

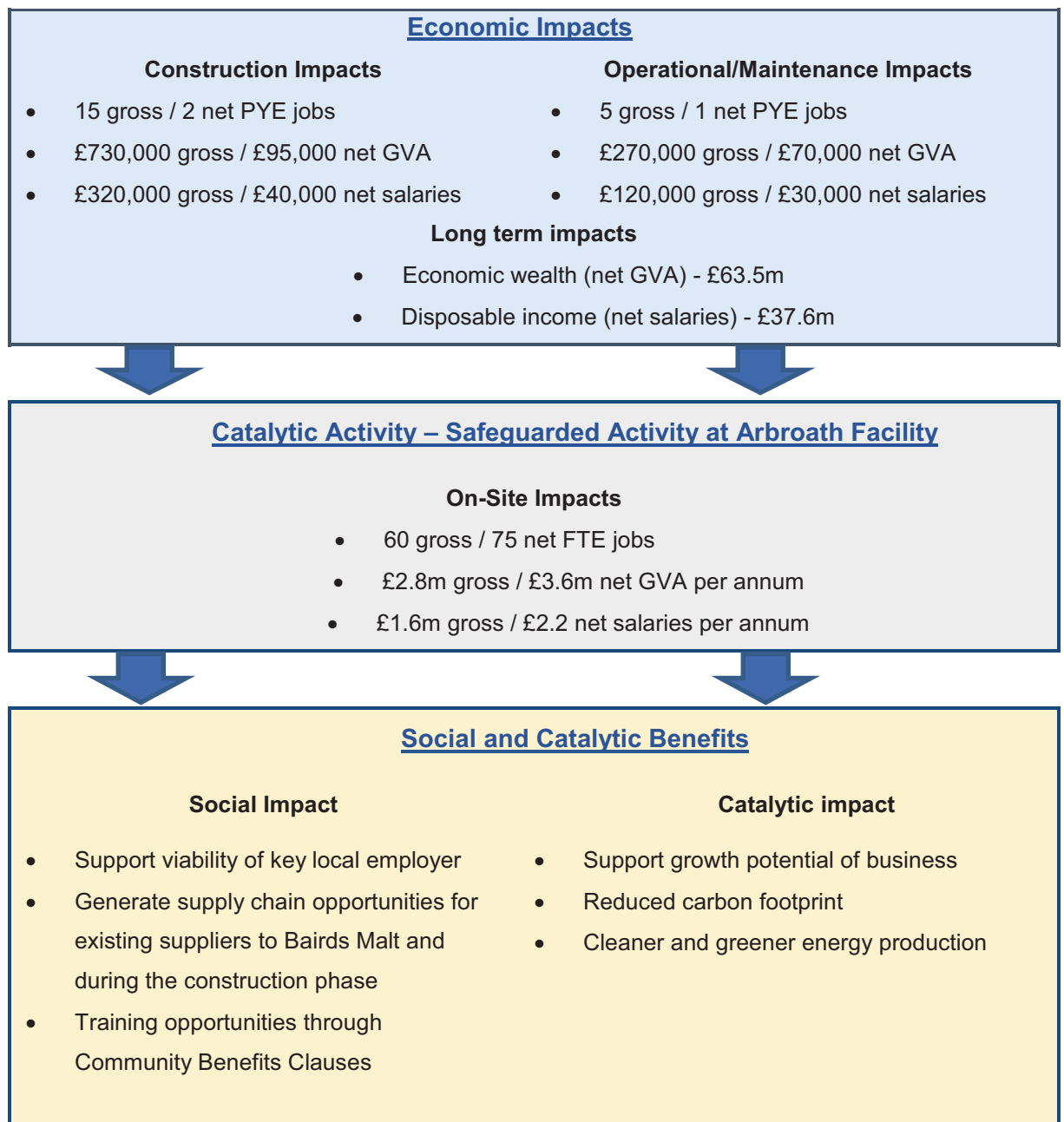


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## Executive Summary

This Executive Summary presents the key economic, social and catalytic impacts predicted to be generated through the proposed wind turbine development at the Bairds Malt facility, Arbroath. All impacts are reported at the Angus Council level.



# 1. Introduction

The Kilmac Group has commissioned EKOS Ltd to undertake an independent assessment that considers the key economic, social and catalytic impacts predicted to result from the proposed renewables project at, the Bairds Malt facility in Arbroath, Angus.

The development proposal is for a single turbine with a hub height of 55m high (blade height 77m) which will provide a sustainable and more cost-efficient energy source for Bairds Malt. The proposed development is estimated to save around one quarter (23%) of the company's annual £3.5m energy costs<sup>1</sup>.

## Bairds Malt

Bairds Malt was formed in 1999 as a merger of Murray Firth Maltings and Hugh Bairds and provides malting products to the brewing and distillation sector across the world. However, the plant in Arbroath was originally opened in 1970 and has been a source of local employment for over 40 years.

The Arbroath facility is the company's Scottish hub and employs people across a range of areas including manufacturing, finance, administration and laboratory work.

The proposed location for the turbine is within the existing Bairds Malt site and it would sit alongside the existing Malting infrastructure.

## Project Details

The key details of the project are outlined below:

- anticipated output generation of 2.3GWh per annum – equivalent to supplying 530 homes (based on the turbine operating at 29% capacity);
- Construction phase:
  - Timescales: 2017 (five week construction/installation period).
  - Total costs - £1.6 m;
- Operational phase:
  - Timescales: 2017 – 2042.

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<sup>1</sup> Information provided by Bairds Malt/the Kilmac Group.

- Total costs (ongoing operation and maintenance) - £0.6m, this represents 1.5% of capital costs on an annual basis; and
- Decommissioning phase:  
Timescales: 2042 – 2043.

The assessment is based on information and data available as public records, as well as that supplied by the development team. It provides our estimate of the likely economic and social benefits generated through the proposed development. It does not comment on the need for, or business case for the project which has been developed elsewhere.

The remainder of the report is structured as follows:

- [Section 2](#): Baseline and Policy Review;
- [Section 3](#): Economic Impact;
- [Section 4](#): [Social](#), Catalytic and Environmental Impact;
- [Appendix A](#): Logic Model; and
- Technical Appendix.

## 2. Economic Baseline and Policy Review

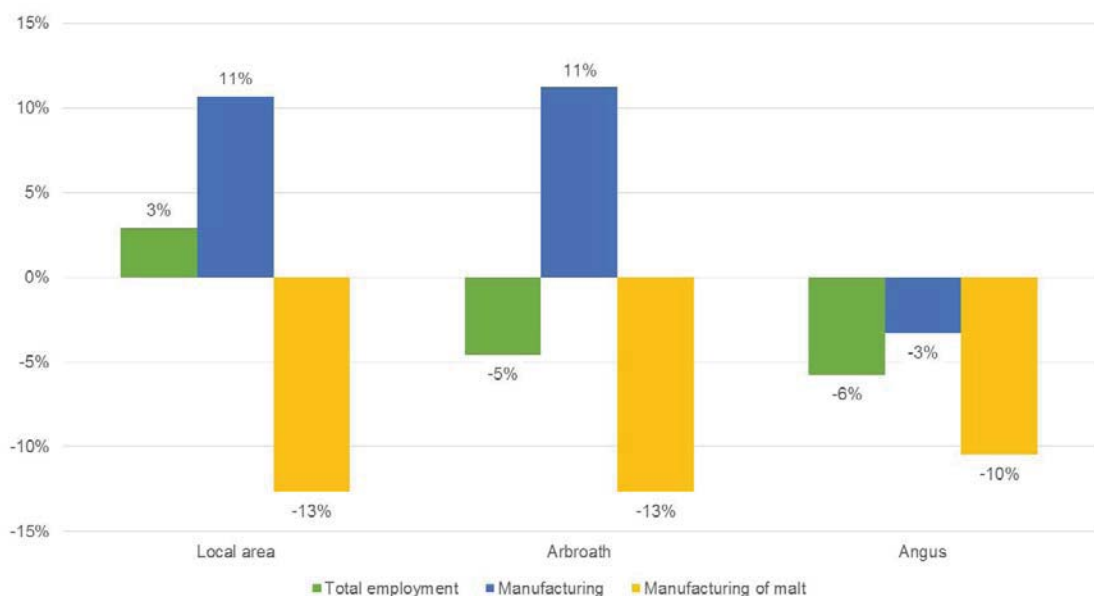
### 2.1 Economic Baseline

As of 2014, Bairds Malt had 207 employees in the UK, with over one quarter (57 employees, 28% of employment) based at the Arbroath plant.

In 2012, employment in the manufacturing sector across Arbroath stood at 1,800 employees (representing 19% of total employment) – the 57 on-site Bairds Malt employees therefore account for just over 3% of employment within this key sector.

Outside the public sector, manufacturing remains the largest employer across Angus – comprising 15% of all employment. That being said, recent data shows that this key sector has suffered losses across the employment base over the last few years and experienced a decline of -3%, compared with a -6% decline within the employment base more generally., see [Figure 2.1](#).

**Figure 2.1: Changes in Key Sector Employment (2009 to 2012)**



Source: BRES

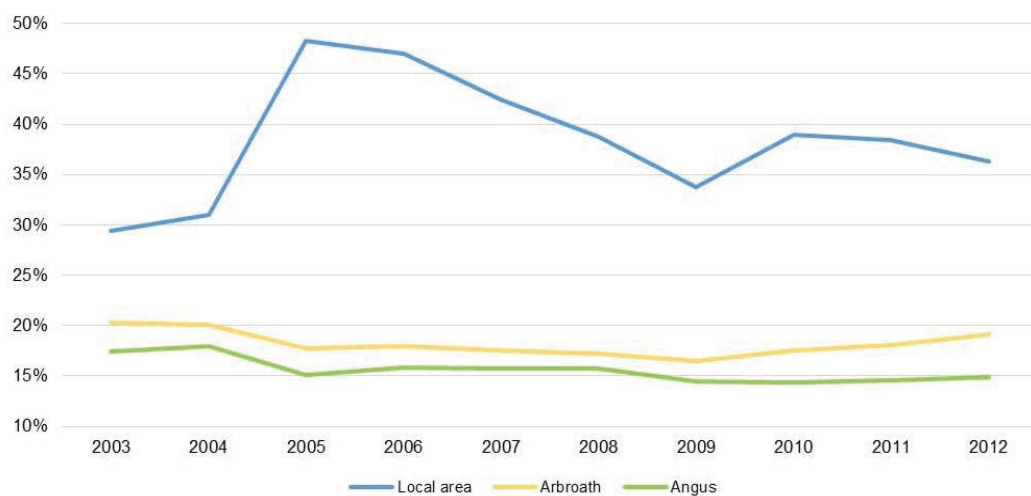
It should also be noted that there has been a disproportionate decrease in employment in manufacturing of malt across all the comparator areas.



Like many areas of manufacturing, this appears to be a very price sensitive sub-sector and fluctuations in the market can have a significant impact on activity, for example cheaper freight/haulages costs and tax breaks within competing European countries.

The proposed development would help support the sustainability of a well-established manufacturing company that has been operating in the local area for 40+ years and accounts for a notable proportion of the manufacturing sector, see [Figure 2.2](#).

**Figure 2.2: Change in manufacturing share of employment (2003 – 2012)**



Source: ABI/BRES

Further investigation of the data highlights the reliance the immediate local area<sup>2</sup> has on the manufacturing sector – in 2005 the sector accounted for almost half the jobs in the local area (48%). Over the years, however, the reliance on the manufacturing sector as a source of employment (across all three areas) has decreased as jobs have been lost.

### Wider Businesses Supported

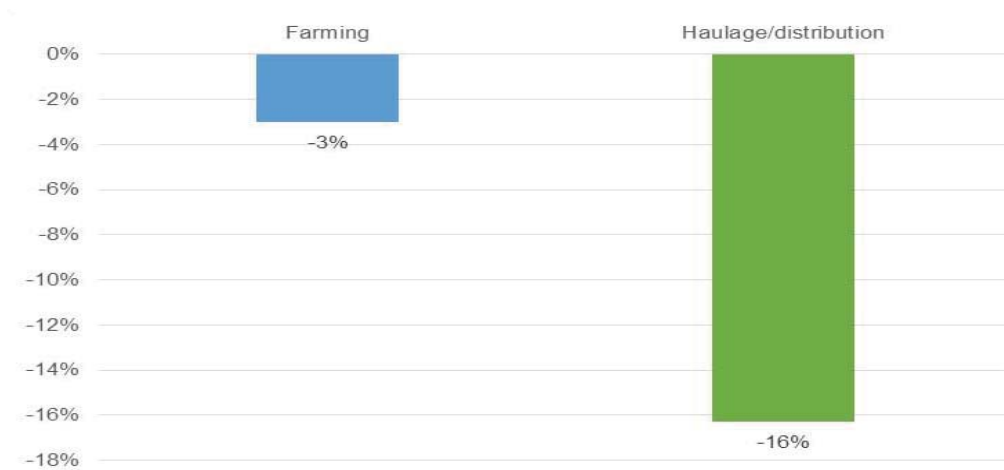
The Bairds Malt facility not only supports local jobs directly, but helps support and sustain other local businesses through supply chain contracts and linkages. In particular the farming of grain crops and seeds, haulage and distribution, and suppliers of agrochemicals.

<sup>2</sup> Defined as the Census Area Statistic (CAS) 2003 ward, Arbirlot and Hospitalfield.

Bairds Malt has live farm accounts with c. 1,000 farms across the UK - 230 of these farm accounts are within Angus. In addition, they regularly work with eight haulage companies for supply and distribution as well as sub-contracting other local engineering services for plant and machine maintenance, etc.

Through these wider supply chain activities it is apparent that Bairds Malt is very important for supporting and sustaining a number of other locally based businesses - particularly in sectors such as farming/agriculture, and transport and storage, where employment has experienced a decline, see [Figure 2.3](#).

**Figure 2.3: Change in Angus Based Employment across Supply Chain Sectors (2009 – 2012)**



Source: ABI/BRES

Across Angus, employment in both the farming/agriculture and haulage/distribution sectors have decreased in recent years; (-3%) and (-16%) respectively for the period 2009-2012.

## Overview

From a summary review of secondary data, it is apparent that Angus is dependent on a few key sectors – one of which is manufacturing. The continued operation of the Bairds Malt facility will ensure the safeguarding of local jobs directly, but will also help support a number of wider supply chain businesses.

The distilling sector in Scotland is forecast to grow at 5% per annum<sup>3</sup>, with the Whisky sector in particular a very high growth and profitable sector.

However, there is considerable competition with non-Scottish based companies looking to enter these markets, particularly through the supply chain. Tax breaks and reduced haulage/transport/distribution costs within competitor countries in Europe means that it is therefore important that Scottish based companies can remain competitive on price within other areas of their business.

Therefore, efficiency savings in relation to utilities and energy costs (overheads) is one of a few key areas that will help Scottish businesses remain competitive – the turbine is anticipated to meet 23% of Bairds Malt’s energy requirements, equivalent to savings of c. £0.8m per annum.

## 2.2 Policy Review

The proposal for a wind turbine development at the Bairds Malt site has a strong strategic fit with key national and local policies across a number of key policy themes, see [Table 2.1](#) over.

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<sup>3</sup> <http://www.farmersguardian.com/home/arable/increasing-demand-for-malting-barley-as-distilling-sector-expansion-continues/62493.article>

**Table 2.1: Fit and Contribution towards Policy**

<b>Routemap for Renewable Energy – Scottish Government 2011</b>	
• increased target to an output equivalent of 100% of Scotland's electricity demand to be generated through renewables	✓
• need for 'rapid expansion' of renewable electricity across Scotland	✓
• securing economic benefits which will underpin national and local economic recovery and continued performance	✓
<b>Strategic Development Plan 2012 – 2032 – Tayplan 2012</b>	
• support the switch to a low carbon and zero waste economy by providing for appropriate infrastructure and improvements in our resilience to climate change and other potential risks.	✓
• support an advanced, thriving and diverse economy occupying a competitive position within European and world markets.	✓
• reduce resource consumption through provision of energy management infrastructure...[and] contribute towards greater regional energy self-sufficiency	✓
• promote and enhance places and landscapes as economic drivers and tourist destinations.	✓
<b>Angus Local Development Plan – Angus Council 2012</b>	
• support the region in becoming 'more sustainable, competitive and vibrant, without creating an unacceptable burden on the planet'.	✓
• support all types of renewable energy development in the area	✓
• reduction of greenhouse gas emissions, through the installation of low and zero carbon generating technologies	✓
<b>Angus Community Plan and SOA – Angus Council 2013</b>	
• supporting enterprise and infrastructure in key sectors including tourism & hospitality, and energies	✓
• develop a strong business base within the sustainable energies and tourism sectors over the next 10 years	✓

### 3. Economic Impacts and Benefits

The economic impacts are reported as jobs (Person Year Equivalent – PYE and Full Time Equivalent – FTE), Gross Value Added (GVA) and salaries, and have been calculated using a bespoke appraisal model and based on HM Treasury ‘Green Book’ guidance. Impacts are reported at the local (Arbroath), regional (Angus) and national (Scotland) level. A full breakdown of the Socio-Economic Impact Assessment (SEIA), including the additionality factors and assumptions used are contained within the [Technical Appendix](#).

Our assessment takes account of a range of economic impacts:

- [construction impacts](#) – captures the one-off impacts associated with the construction of the wind turbine;
- [operational/maintenance impacts](#) – captures the new operational/maintenance jobs that are predicted to be generated. This could include, for example, turbine service works, and insurance costs, etc;
- [safeguarded on-site impacts](#) – captures the activity that will be safeguarded at Bairds Malt as a result of making the business more sustainable in the long term; and
- [cumulative impacts](#) – captures the net discounted impacts of the proposed turbine development over a 25 year appraisal period – the serviceable life expectancy of the turbine.

In addition, there will be economic activity and impacts associated with the decommissioning of the turbine after its serviceable lifetime (25 years). However, given the time lag for these impacts to occur and other unknown variables, we have excluded these potential impacts from our assessment.

#### Technical Note

Throughout this report a number of technical economic terms are used:

- **gross jobs:** the direct jobs accommodated on-site at the proposed development. The gross operational on-site jobs and the salary costs have been provided by Bairds Malt. However, the economic output associated with these jobs (GVA) has been taken as the sectoral average from official published data;



- net jobs – the out-turn of the gross jobs taking account of:
  - the impact the development is estimated to have on other businesses and the labour market (displacement)
  - the proportion of impacts that will benefit those outwith the defined spatial areas (leakage)
  - the positive spin off benefits generated through income and supplier multiplier effects;
- PYEs – the construction and on-site (operational/maintenance) jobs are based on Person Year Equivalents (PYE). This method allows the number of people on-site over the 25 year lifetime of the project (which will vary over the period between full-time, part-time, permanent, temporary and contract) to be estimated as an annual equivalent post. Please note, these PYE impacts are one-off;
- FTEs - jobs or posts where the working hours are a minimum of 37 hours a week and last for a period of ten years;
- Gross Value Added – GVA is a measure of the value of goods and services produced before allowing for depreciation or capital consumption. GVA measures the income generated by businesses after the subtraction of input costs but before costs such as wages and capital investment. GVA is the Government's preferred method for measuring economic performance; and
- net cumulative discounted impacts – the total quantified value of the net additional GVA impact over the 25-year project lifetime taking account of the date at which the development will be completed and occupied, and the time value of money i.e. £1 today is worth more than £1 next year. We have used the HM Treasury Social Time Preference Rate (3.5%) to discount the estimated impacts.

## Disclaimer Note

Please see Technical Appendix.

## 3.1 Gross Economic Impacts and Benefits

This section considers the gross economics and impacts associated with the proposed project. Please note that gross impacts are the same across different geographic levels.

### 3.1.1 Construction Phase

The economic impacts delivered during the construction phase are based on the expenditure profile provided by the Kilmac Group. The total project costs are estimated at £1.6m.

Using a bespoke economic model and industry sector co-efficients to calculate the impact of the capital expenditure, we estimate the turbine development is likely to generate the following gross construction impacts<sup>4</sup>:

- 15 PYE jobs;
- £320,000 in salaries; and
- £725,000 GVA.

Please note that the construction impacts are one-off and will be generated during the estimated 5 weeks construction period.

### 3.1.2 Operational and Maintenance Phase

During the lifetime of the turbine there will be additional annual expenditure to support the operation and maintenance, for example upgrades to machine parts, and servicing. The total cost of this is estimated at 1.5% per annum of the total capital costs<sup>5</sup>.

£1.6m \* 1.5% = £24,000 per annum or £0.6m (unadjusted costs) over the lifetime of the turbine.

<sup>4</sup> Note: Gross impacts are assessed based on the development costs and breakdown outlined in the Technical appendix and are the same at different spatial geographies. Jobs rounded to the nearest 5 and salaries and GVA to the nearest £5,000.

<sup>5</sup> Please note this is an estimate based on information from the European Wind Energy Association and the Kilmac Group.

The gross economic impacts that are likely to be generated through the operational and maintenance activities are reported below and are new to the economy<sup>6</sup>.

- 5 PYE jobs;
- £120,000 in salaries; and
- £270,000 in GVA.

### 3.1.3 Safeguarded On-Site Impacts

As highlighted above, the installation of the wind turbine will reduce energy costs by around one quarter (23%), equivalent to c. £0.9m per annum. As the malting facility is a 24/7 operation the overheads costs are significant and an increase in energy prices could have a significant impact. Given the significant power/energy needs of the businesses, any electricity generated through the turbine will be used on-site and not sold back to the grid for profit.

The proposed turbine project could therefore have a significant beneficial impact on enhancing the commercial/financial viability and sustainability of the business over the longer term.

Table 3.1 identifies the jobs that the project will help safeguard.

**Table 3.1: Gross Safeguarded On-Site Impacts**

	<b>Safeguarded Impacts</b>
<b>FTE jobs</b>	55
<b>Salaries per annum</b>	£1.6m
<b>GVA per annum</b>	£2.8m

## 3.2 Net Economic Impacts and Benefits

In order to undertake a robust assessment of the potential new activity generated through the proposed turbine project, the gross impacts cannot be considered in isolation and must take account of a range of other factors – displacement, leakage and multiplier effects (as detailed in the **Technical Appendix**).

Please note that gross and net impacts are not cumulative, but that net impacts are the outturn of the gross impacts after accounting for additionality factors.

### 3.2.1 Construction Phase

The turbines will be sourced and manufactured from outwith Scotland, however, there will be a number of opportunities for Scottish and Angus based suppliers and sub-contractors, for example site preparation, civil engineering works, renting of equipment/machinery etc.

Further, the Kilmac Group have identified that, where possible they will work with local suppliers to ensure economic activity is retained within the local area.

The net construction impacts are reported in **Table 3.2**.

**Table 3.2: Net Construction Impacts**

	PYE Jobs	Salaries	GVA
<b>Arbroath</b>	3	£70,000	£165,000
<b>Angus</b>	6	£150,000	£340,000
<b>Scotland</b>	11	£260,000	£590,000

Note: Salaries and GVA rounded to the nearest £5,000

### 3.2.2 Operational and Maintenance Phase

Similar to the construction phase there will be opportunities for local businesses during the lifetime of the project to support the operations and maintenance of the turbine.

The net impacts of the operational and maintenance phase are reported in **Table 3.3**.

**Table 3.3: Net Operational and Maintenance Impacts**

	PYE Jobs	Salaries	GVA
<b>Arbroath</b>	0	£5,000	£5,000
<b>Angus</b>	1	£30,000	£70,000
<b>Scotland</b>	7	£400,000	£180,000

### 3.2.3 Safeguarded On-Site Impacts

The majority of on-site jobs are taken by people from the Angus area, therefore a large proportion of the salaries/wages will remain within Angus.

Through supporting efficiency savings (reducing overheads) the turbine will support the longer term viability of Bairds Malt, it is therefore important to consider the impact on securing and safeguarding the current activity generated at the site.

Table 3.4 outlines the impact of safeguarding the current level of activity at the Bairds plant.

**Table 3.4: Net Safeguarded On-Site Impacts**

	Impacts
<b>Arbroath</b>	
FTE jobs	40
Salaries per annum (£)	£1.1m
GVA per annum (£)	£1.9m
<b>Angus</b>	
FTE jobs	75
Salaries per annum (£)	£2.2m
GVA per annum (£)	£3.6m
<b>Scotland</b>	
FTE jobs	130
Salaries per annum (£)	£3.7m
GVA per annum (£)	£6.3m

### 3.3 Cumulative Impact

The estimated serviceable lifetime of the turbine is 25 years. Whilst the construction impacts will be one-off, there will be ongoing economic activity associated with the operation and maintenance of the project during the 25 year period, plus the safeguarded activity on-site at the malting facility to consider.

It is therefore important that we measure the longer term cumulative economic impact of the project.



When considering the longer term effects, it is important to understand wider market factors such as the time periods over which new economic activity is generated and the ‘present value’ of impacts i.e. adjusting historical and future impacts into today’s values<sup>7</sup>. Cumulative impacts have therefore been adjusted/discounted the economic and financial impacts using the HM Treasury recommended rate of 3.5%.

Below we have considered the net cumulative effects over a 25 year period - please note that this accounts for both the construction, operational and maintenance, and safeguarded activity<sup>8</sup>.

**Table 3.3: Net Cumulative Impacts of Turbine Project (25 years)**

	Salaries	GVA
Arbroath	£19.3m	£32.5m
Angus	£37.6m	£63.5m
Scotland	£65.2m	£110.3m

Note: Salaries and GVA rounded to nearest £0.1m

A review of the cumulative impacts identifies the significant scale of the economic activity that the proposals could generate within the Angus economy.

Over the 25-year lifetime the proposed turbine project is estimated to support/safeguard **c 60 Full Time Equivalent jobs** at Bairds Malt, create **20 construction/operational/maintenance PYE jobs** and generate/safeguard **net additional economic output (GVA) of c. £63.5m** and **expendable income (salaries) of c. £37.6m** within the Angus economy.

<sup>7</sup> See HM Treasury Green Book for more information  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220541/green\\_book\\_complete.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf)

<sup>8</sup> Please note that for the purposes of our assessment we have assumed that the malting facility will continue to operate at current levels.

## 4. Social, Catalytic and Environmental Impacts

One of the key issues to consider over and above the quantifiable economic impacts reported above is the likelihood of additional social and catalytic impacts/benefits for the local area, and Angus more generally.

### 4.1 Social and Catalytic Impacts

#### Support Viability of Key Local Employer

##### Key Points

Bairds Malt is an important source of local employment – employing 57 people from the Angus area, which in turn generates disposable income (salaries), a notable proportion of which will be spent in the local economy.

Bairds Malt has been operating from its site in Arbroath for 40+ years and employs 207 people across the UK, including 57 within the immediate Angus region - this helps to demonstrate how important a part of the local area the plant has become. The facility employs people across a range of disciplines/areas including management, engineers, and administration.

Manufacturing remains a key employing sector (2<sup>nd</sup> largest behind the public sector), and whilst the sector has experienced an overall decline across Angus, Bairds has managed to retain similar levels of activity/employment during, and off the back of the recession (whilst others have lost jobs or closed).

Looking to the future, the company has targets to grow by c. 5% annually (based on UK wide forecasts for the wider distilling industry). These targets however, are dependent on a number of external and internal factors, including production efficiency – of which energy costs will play a significant role.

The plant operates on a 24/7 basis and total site costs are estimated at £5m per annum, with £3.5m of this related to utilities. The proposed turbine project will not only generate significant CO<sub>2</sub> and carbon savings but it is anticipated to reduce energy costs by 23% - around £0.8m per annum.

These efficiency savings will likely have a significant impact on both safeguarding the existing activity and ensuring the plant's longer term financial/commercial viability and sustainability, but also support the growth ambitions of the company. This could potentially lead to further employment opportunities for Angus residents.

This is particularly important as over the next few years there will most certainly be further cuts in public sector spending which will likely lead to further job losses – as highlighted above, the public sector is the largest employer across Angus. There is therefore a key role for the private sector (and in particular those businesses with growth ambitions) in supporting the local economy.

### Supply Chain Opportunities

#### Key Points

Bairds is not only an important part of the local economy through providing direct on-site employment opportunities, the company also works with a number of suppliers from the local area.

In addition, there is an opportunity for local businesses to work with and benefit from the proposed development through supply chain linkages during the construction stage –of the turbine, and during the ongoing operational/maintenance phase during the lifetime of the project.

The Kilmac Group have a strong track record in working with local contractors and suppliers during the assembly and installation stages. Further, they have made a commitment to offer training and apprenticeship schemes to help ensure that local people have access to these employment opportunities – local jobs for local people, in particular targeted at 'hard to reach' groups.

The wider supply chain impacts can be broken down into two separate categories:

- **direct suppliers to Bairds Malt** – companies that are part of the supply chain that provide goods and/or services that supports the operations of the plant facility; and
- **suppliers to the construction phase** – associated with the construction of the turbine this could include site preparation works, site security, civil/electrical/mechanical engineers works, tradesman and labourers.

## Direct Suppliers to Bairds Malt

The malting facility has a diverse range of suppliers from both the local area and beyond, this includes: grain and seed crops, fertilizer, agrochemicals, and haulage/distribution.

Information provided by Bairds Malt identifies that company has live farm accounts with around 1,000 business, 230 of which are located in Angus, and in addition regularly sub-contracts a number of local haulage companies.

Bairds Malt is an important locally based company that, through its significant supply chain expenditure supports other businesses within the local economy and helps to retain economic activity in Angus.

## Suppliers to the Construction Phase

The total cost of the turbine is estimated at c. £1.6m and there will be an opportunity for local suppliers to support the installation and operation of the turbine throughout the 25 year serviceable lifetime.

Whilst the physical 'working parts' (blades, tower, etc) will come from outside of Scotland, as will the specialist workers for the installation process, there will be sub-contracting opportunities for Angus based suppliers for other key areas such as the site preparation works, landscaping, civil engineering, grid connection and maintenance work will - all likely to be based in Scotland.

This therefore represents a good opportunity for local contractors and suppliers to benefit from the proposed development. The Kilmac Group (along with the turbine manufacturing partner, Enercon) will lead the construction and installation stages. Both companies have a strong track record of working with local businesses – this will support the ambition to retain as much economic value locally as possible.

A key way in which the project can positively impact the local economy is through facilitating local employment training and apprenticeship schemes during the construction, and operational and maintenance phases. These schemes can be targeted at particular groups e.g. young people and, in addition to helping develop new skills etc, will also help to build confidence in supported individuals.

For example, during the South Inch play park project, Kilmac Construction recruited a total of nine apprentices/work experience positions in various construction and engineering disciplines. The apprenticeships were undertaken by young people from the local area that were ex-offenders, and all of whom had previously experienced barriers to accessing employment opportunities.

Subsequently, eight of the apprentices have gone on to access full time employment, six working directly for Kilmac Construction or one of their main sub-contractors. See the following link within the Perth and Kinross Council website for further detail (<http://www.pkc.gov.uk/article/7323/New-South-Inch-play-area-celebrates-environment-and-community>).

While it is too early to comment on the extent of any local training and apprenticeship scheme being employed in the context of the proposed development, it is clear there is an opportunity for the proposed development to work with local employability partners, support the local youth employment agenda and contribute to the objectives of the Single Outcome Agreement through a focused training initiative.

## Community Engagement

In addition to being a key local employer, Bairds Malt are active in the local community and have contributed funding, resources and support to a number of local projects, including:

- Arbroath Skate park Project Club;
- Arbroath Year of the Light; and
- The Royal Highland Education Trust.

## 4.2 Environmental Impacts

As already considered above, green energy, reducing carbon intensity and CO<sub>2</sub> emissions is a significant policy driver at the national and regional levels.

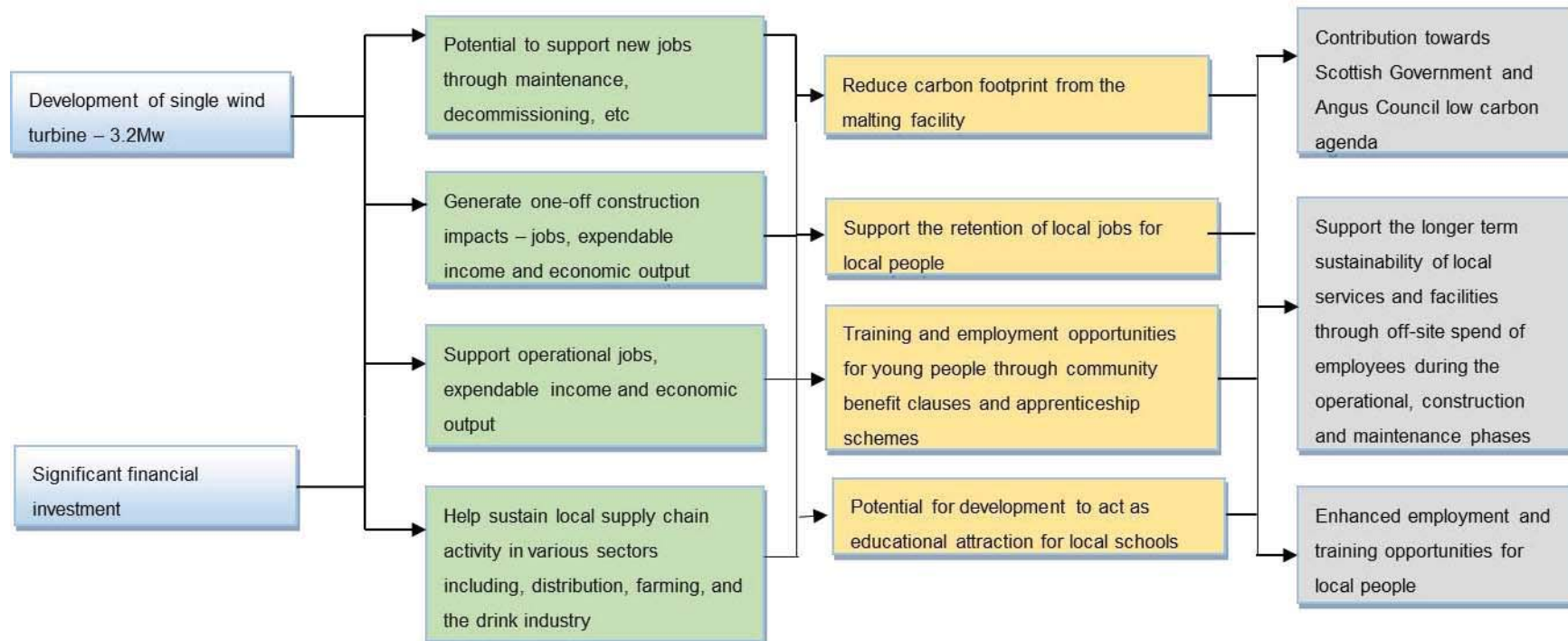
As already considered above, Bairds have a long term strategy to both reduce their expenditure on utilities and their environmental footprint. As a result they have reviewed a number of green energy projects to support this including; geothermal, solar and biomass. The turbine project, however, makes the greatest contribution towards achieving both environmental and financial sustainability objectives.



The project (when working at the expected operational capacity, 29%) will generate 2.3 Gwh per annum in electricity. This is equivalent to providing electricity for 530 homes every year and will generate CO<sub>2</sub> savings (980 tonnes per annum) and carbon savings (280 tonnes per annum).

## Appendix A: Logic Model

### Enhance the Economic and Social Sustainability of the Local Arbroath Area



# Technical Appendix

## Disclaimer Note

The SEIA has been undertaken based on information provided by Kilmac, and based on EKOS' professional judgement and assumptions, outlined below in the Technical Appendix. It does not constitute a detailed market demand assessment but outlines the potential impacts that could be delivered through proposals.

Our review is based on current economic conditions and identifies the potential impacts and benefits that could be generated from the development if completed in full, and occupied as per our detailed assumptions.

The actual results, however, will likely vary from those projected as they will be subject to future market conditions and other economic influences, as well as performance against the assumptions adopted by EKOS.

Variances from our projections could be material (positive or negative), but it should be noted that EKOS has adopted a robust appraisal methodology in the estimation of the economic impacts for this development proposal.

We do not anticipate substantial variation, unless there is major change in the economic structure, change in market profiles, and/or competition from other developments in the local, regional or national area.

## Introduction

This appendix provides the detailed socio-economic impact appraisal (SEIA) and assumptions used within our assessment. This assessment has included an ex-ante EIA and has been undertaken in line with HM Treasury 'Green Book' guidance and using a bespoke appraisal model to assess gross and net outputs.

The impact assessment considers the on-site impacts, one-off construction impacts, operational/maintenance impacts, financial impacts and the longer term economic impacts.

A copy of the detailed Excel model used within our assessment can be obtained through contacting the report author direct.

## Gross Impacts

The gross economic impacts i.e. jobs, Gross Value Added (GVA) and salaries have been calculated based on information provided by the development team and using sectoral co-efficients, specifically turnover/capital expenditure/ per employee for the wider sector.

## Construction and Operational/Maintenance Impacts

The construction phase of the development will generate additional one-off construction impacts associated with the new investment and development, whilst there will also be on-going activity associated with the operation and maintenance of the turbines.

Our analysis of the renewable sector employment impacts are based on Scottish Annual Business Statistics data. The analysis uses an employment co-efficient of £122,478 spend required to sustain one full-time employee for a period of one year – a Person Year Equivalent post (PYE).

The renewables co-efficient is derived from Scottish Annual Business Statistics (2011, and adjusted using the GDP Deflator to reflect 2013/14 prices)<sup>9</sup>, which provides data on the average construction spend per employee.

The jobs are based on PYEs, and this method allows the number of people on-site over the whole delivery period (which will vary over the period between full-time, part-time, permanent, temporary and contract) to be estimated as an annual equivalent post – PYE.

Gross jobs are derived from dividing the total costs, (estimated at £1.6m for the construction element and £0.6m during the operational and maintenances phases respectively) by the renewable sector employment co-efficient (regional figures provided).

**Table A1: Gross On-site Job Assumptions**

Construction costs	Costs	£ T/O per employee	Gross jobs
Capital cost	£1.6m	£122,478	13
Maintenance costs	£0.6m	£122,478	5

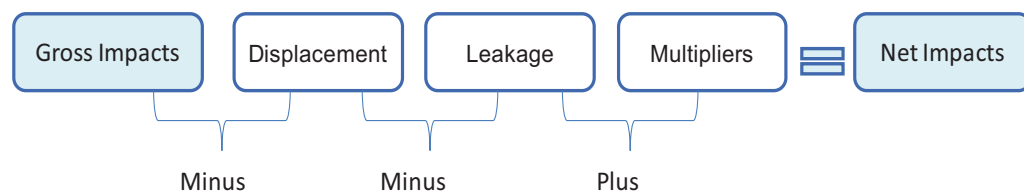
<sup>9</sup> Please note that at the time of finalising this report, the most up-to-date information with regards price adjustment (using the GDP Deflator) was for 2013 prices (updated on 8 January 2014).

Gross PYE job impacts are then taken through the gross to net calculation as outlined below.

## Net Impacts

However, in order to assess the true economic impact, the gross employment is considered in terms of displacement, leakage and multiplier effects – the logic chain, see Figure A1. Please note, the net impacts are assessed at the Arbroath, Angus, and Scotland levels.

**Figure A1: Moving From Gross to Net Impacts**



## Gross Value Added (GVA) and Salaries

Gross Value Added (GVA) is a measure of the value of goods and services produced before allowing for depreciation or capital consumption<sup>10</sup>.

GVA measures the income generated by businesses after the subtraction of input costs, but before costs such as wages and capital investment is paid prior to arriving at a figure for profit.

Salaries measure the employment costs (not including employer's contributions to NI, etc) for labour, this can be considered as the gross expendable income i.e. 'take home gross pay'.

GVA and salaries per employee are calculated for the renewable sector based on data from the Scottish Annual Business Statistics.

Latest data was for 2011 and therefore, this was adjusted to 2013/14 prices using the GDP Deflator, see Table A2.

<sup>10</sup> Gross Value Added (GVA) is equivalent to Gross Domestic Product (GDP) at basic prices.



**Table A2: Average GVA and Salary per Employee Assumptions**

	Average	Uprated to 2014
<b>Highland/Skye</b>		
GVA	£53,434	£55,643
Salaries	£23,563	£24,537
<b>Scotland</b>		
GVA	£60,957	£63,477
Salaries	£29,185	£30,391

Source: Scottish Annual Business Statistics

The GVA and salary impact is derived from multiplying the jobs by the average GVA/salary per employee figure – for both gross and net impacts.

### Activity at Bairds Malt

The turbine project will help to safeguard and secure the existing activity at the Bairds Malt facility. For the purposes of the appraisal we have calculated the wider impacts that the project will help safeguard.

The gross jobs are based on information provided by Bairds Malt – 57 FTEs at the Arbroath facility. The average salary costs for employees has been provided by Bairds Malt and GVA co-efficients for the food and beverage manufacturing sector have been used to calculate the economic activity associated with these jobs. Figures are for 2011 and therefore have been uprated to 2014 prices and to FTEs, see Table A3.

**Table A3: Average GVA and Salary per Employee Assumptions – Bairds Employees**

	Average	Uprated to 2014 FTE
GVA	£43,252	£48,478
Salaries	-	£28,733

### Long Term Impacts

In order to assess fully the impact of the proposed activity, it is important to consider the longer term impact it is likely to have on the local economy, both directly through the turbine project, but also through safeguarding activity at the Arbroath facility.

In order to accurately gauge the impact we must consider the total quantified value of the development impact over the 25 year serviceable lifetime of the project, taking account of the date at which the development will be completed, and the time value of money i.e. (£1 today is worth more than £1 next year). We have used the HM Treasury Social Time Preference to discount the estimated impacts at 3.5%.

Full details of the cumulative impacts and the adjustments taking account of the 3.5% discounting factor can be obtained by contacting the report author direct.



Green Cat Renewables

## **BAIRDS MALT**

### **NOISE ASSESSMENT**

#### **Compliance with noise management criteria**

November 2015

Green Cat Renewables Ltd

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**Report prepared for:**  
Richard Broadbent

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## BAIRDS MALT

## NOISE ASSESSMENT

**Prepared By:**  
Merlin Garnett

November 2015



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\\BIGGAR\Environmental\New Projects\Noise Work\\_\_Completed  
Work\_\C0621-163 Bairds Malt Background Noise\Compliance  
Work\Bairds Noise Assessment - v1.0.docx

Checked By: <b>Merlin Garnett</b>	Date: 24/11/2015
Approved By: <b>Cameron Sutherland</b>	Date: 26/11/2015

## 1 Introduction

### 1.1 Overview

A noise audit of the plant installed at Bairds Malt during 2007 was requested by Angus Council Environmental Health. The audit should assess whether this plant is likely to be operating within guideline noise limits stated at the time of planning consent. The survey is conducted within the context of a proposal, under consideration by the Council, to construct a medium scale wind turbine at the site. Bairds Malt engaged Green Cat Renewables to conduct the audit.

Attended noise measurements took place during two site visits that occurred on the 20<sup>th</sup> September and the 5<sup>th</sup> of November 2015, the former taking place in the company of Steve Thompson representing Angus Council and Richard Broadbent representing Bairds Malt and who assisted in identifying the relevant noise sources.

## 2 Baseline

### 2.1 Noise sources

The 2007 plant was identified via Section 2 of a Noise Management Plan commissioned on behalf of the Malting's and dated 6 August 2008:

*The plant comprises:*

- a) Barley driers and associated wet barley storage silos.*
- b) Combined steeps and germination vessels with associated barley storage and washing plant.*
- c) A malt kiln and associated malt storage bins.*
- d) Barley and malt handling and transfer plant.*
- e) An electrical sub-station.*

### 2.2 Assessment positions within the site

Section 6 of the plan recommends monitoring locations within the site. These are suggested with the aim of minimising the influence of the noise emissions of pre-2007 plant, impinging on the measurements. Noise limits are given for these monitoring locations based on predicted noise levels of the 2007 plant at nearby sensitive receptors, corrected for distance using:  $20\text{Log}(r_2/r_1)$ , as shown in Appendix 4 of the noise management plan.

Noise monitoring location	Maximum noise level to comply with planning consent noise limit
A: 15 m west of the barley drier towers, and 5 m inside the site boundary	56dBA
B: A point 40m equidistant from the steep/germination plant service building and kiln fan house and 5m inside the east site boundary	51dBA

Location A was not considered as the barley driers were not in use. It became apparent during the initial site visit that the noise level at Position B due to the grain washers alone would be significantly above the 51dB criterion. The criterion was derived assuming no



barrier attenuation between source and receptor and does not appear to account for noise produced by the grain washing process. It should be noted that the appropriateness of the application of criterion B was questioned in the Noise Management Plan which stated that other methods could be considered:

***‘These noise measurement locations should be regarded as tentative and subject to alteration following post-commissioning noise measurement experience. Additional in-plant locations may be required. It should be noted that no allowance has been made for screening of noise by existing buildings in the derivation of maximum noise levels.’***

The level of residual noise generated by pre-2007 plant, in the areas around the newer plant, make the identification of further in-plant locations impractical therefore this approach was not explored further.

### 2.3 Noise sensitive receptors

Section 4 of the Noise Management Plan identifies two separate representative receptors:

- a) ***residents of properties in Patrick Allan-Fraser Street, particularly those (Nos 103–107) whose houses back on to a stream and strip of woodland immediately to the north-east of the Bairds Malt site;***
- b) ***residents of Peasiehill Cottages, located close to the western site boundary and immediately to the west of the existing barley storage silo 3.***

### 2.4 Noise constraints

The noise limits given for the two off-site assessment positions are given in the following table and *‘refer to daytime noise levels arising from operation of the new plant, as measured as 1 hour  $L_{eq5}$ , in accordance with BS4142.’*

Location	At rear of Nos 103-107 Patrick Allan-Fraser Street	At front of Peasiehill Cottages
Background noise level, $L_{A90}$ (dB)	34	42
Ambient noise level, $L_{Aeq}$ (dB)	37	43
Predicted noise level from new plant, $L_{Aeq}$ (dB)	35	37
Noise limit applying, $L_{Aeq}$ (dB)	35	39

***For night-time noise (between 2200 and 0700), the noise level should not exceed 45dBA  $L_{max}$  or 35dBA  $L_{eq}$  (5 minutes) in any bedroom, measured in accordance with BS8233.***

### 2.5 GPS Positions

Noise sources were identified and located on the 20<sup>th</sup> of September 2015. Relative positions and horizontal distances of plant and assessment positions are given in the following table. The positions have been derived by cross-referencing GPS measurements, high resolution mapping and satellite imagery. Measurements were deemed to be accurate to  $\pm 5m$ .

Plant	E	N	Distance from PHC (m)	Distance from PAF (m)
<b>Washing plant</b>				
Motor 1	361819	740157	275	252
Motor 2	361822	740154	278	255
<b>Germination plant</b>				
CO2 extract fan 1	361831	740150	288	261
CO2 extract fan 2	361848	740135	307	279
Louvered Intake fans	361851	740161	306	254
<b>Malt kiln</b>				
Vertical vent 1	361787	740197	240	210
Vertical vent 2	361783	740192	236	215
Vertical vent 3	361778	740187	231	220
<b>Assessment positions</b>				
<b>PHC</b>	361547	740197	Representing Peasiehill Cottages	
<b>PAF</b>	361787	740407	Representing the nearest dwellings on the estate	

No significant noise was observed due to the operation of the barley / malt handling and transfer plant or electrical sub-station. The barley driers were not operational and were therefore not assessed.

### 3 Methodology

The approach agreed with Steve Thompson on the 20<sup>th</sup> of September 2015 was to determine sound power levels of the relevant plant through measurement in close proximity, then to propagate that source back to the two off-site assessment positions using conservative assumptions for attenuation.

#### 3.1 Determination of sound power

Sound power was determined for the specific noise sources using a method analogous to *BS:4142-2014* but implemented in close proximity to the sources rather than at far field assessment positions. Many of the sources are variable, ramping up and down as required; all sources were set to operate at full capacity for testing so that worst case levels could be assessed. Residual noise was assessed in the absence of the specific source or via attenuation of the active specific source using a nearby barrier. Noise measurements were corrected for residual noise by logarithmic subtraction; all workings are shown.

As all noise sources were located above ground, to varying degrees, spherical divergence from point sources was assumed. Sound power was therefore calculated using:

$$L_w = L_p + 20 \log r + 11$$

where  $L_p$  is measured  $L_{Aeq,T}$  at distance  $r$  from the centre of the noise source having sound power  $L_w$ .

#### 3.2 Propagation model

Noise levels at the defined off-site assessment positions were assessed using *ISO:9613 - Attenuation of sound during propagation outdoors*. The method of calculation is based on the following expression:

$$L_p = L_w - 20 \log r - 11 + D - A_{air} - A_{ground} - A_{turbulence} - A_{refraction} - A_{barrier}$$

Attenuation (A) via ground effect, turbulence or refraction are not included as they are unlikely to be significant factors in this context (distances of less than 300m).

Directivity (D) was determined through measurement or estimated using conservative assumptions. Atmospheric absorption ( $A_{air}$ ) has been assessed using measured octave band sound powers and the following absorption coefficients which assume atmospheric conditions; 10°C and 70% humidity:

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation Coefficient (dB/m)	0.0001	0.0004	0.001	0.0019	0.0037	0.0097	0.0328	0.117

Barrier attenuation ( $A_{barrier}$ ) was assessed using calculated path difference for single or double diffraction using the equations given in ISO:9613 Section 7 – Screening. Barrier attenuation is frequency dependent and was therefore calculated using measured octave band sound powers as input values. The actual barrier attenuation offered by the various on-site obstacles may be less than calculated due to atmospheric effects or multiple noise pathways, therefore the calculated value is not used directly in the propagation calculation but is used instead to inform and justify the selection of a more conservative nominal value.

### 3.3 Assessment method

All the noise sources measured were observed to be relatively stable in both amplitude and frequency content having a maximum periodicity of no more than a few seconds duration and producing amplitude modulation of no more than 3dB. Consequently,  $L_{Aeq,T}$  values measured with values of T between 25 and 45 seconds were deemed of sufficient length to be representative of the  $L_{Aeq,1hour}$  values listed as daytime noise constraints in accordance with BS:4142. Noise sources were initially monitored to establish the extent of their near field thereby determining a representative measurement position. For the purposes of calculation, a notional measurement distance of 1m was ascribed to all sources except the germination intake fans where the near field of the source could not be accessed. This approach was deemed to be appropriate by Angus Council.

In the case of the louvered air intake fans on the germination building, directivity was determined by taking a series of off axis measurements with particular attention paid to angles relevant to the assessment positions. In the case of the CO<sub>2</sub> fans at the top of the germination building, the directional hoods were deemed to provide a minimum attenuation of 5dB to the directly measured noise level.



The path difference calculations, necessary to assess barrier attenuation required the size and position of barriers to be determined. Height information was obtained from details in the noise measurement plan or from the production manager. Relative positions on the ground were obtained from high resolution plans and mapping. These calculations are given at Appendix 1.

Where the barrier obscures line of sight but not much more (small path differences) a nominal -5dB barrier attenuation has been deemed appropriate. Where a single barrier significantly obscures a noise source (single diffraction), a -10dB attenuation is allocated and when there is a long barrier or when there are two barriers separated by 20m or more (double diffraction), a -15dB attenuation has been deemed appropriate. These nominal attenuation values are conservative (low) when compared to ISO calculations.

At all stages, calculations were made and reported to the nearest whole decibel.

### 3.4 Noise sources

#### 3.4.1 Grain Washer motors



Measurements were taken of the two motors from various angles at distances of between 0.5 – 1.0m. A representative position for Motor 1 (pictured) was found using the southern access gangway. The two motors were in close agreement ( $\pm 1$ dB) in terms of  $L_{Aeq,T}$  and so spectra taken for Motor 1 were deemed to be representative of Motor 2. Residual measurements were made with the motors switched off at ground level.

#### 3.4.2 Germination CO<sub>2</sub> Fans



Located on the roof of the germination vessel, Fan 1 (pictured) was measured at a distance of 1m. Residual measurements were made in approximately the same position just before the source was activated. The fans were set to operate at full power.

### 3.4.3 Germination intake fans



Measurements were made at a horizontal distance of 8m with all four fans operating at full power. An overall sound power was determined for the fans but this was then divided between two equal sources deemed representative of the upper and lower fans so they could be treated independently.

Directivity was assessed by measuring levels in the direction of Patrick Allan Fraser St relative to the on axis measurements. A reduction of 5dB was observed at the same distance. Barrier attenuation was also preliminarily tested by measuring at a position beyond the corner of the building thereby blocking line of site. A reduction of 8dB was observed for the same distance and applied as a directivity adjustment relevant for Peasiehill Cottages, rather than barrier attenuation.

### 3.4.1 Kiln Flues



Measurements were made from the access walkway at a height equal to the top of the flues. The noise meter was moved as close to individual flues as could be safely achieved (approximately 1.3m). No significant increase in level were observed as the measurement distance reduced below ~1.5m indicating that this measurement range approximated the extent of the source near field.

Flue 1 (pictured) was significantly louder and had a more even frequency distribution relative to the other two, which exhibited significant sound pressure levels in the 250Hz octave band. The residual measurement was taken at the eastern extent of the access walkway with all flues active. This provided an indication of how much the noise from each flue may have impinged on the measurement of its neighbour. The flues carry exhaust air from large gas boilers.



The sound power derived for Flue 1 was 2dB less than that measured during the previous site visit on the 20<sup>th</sup> of September when the barley plant opposite was in full operation, but potentially contributing to the measured level. Given the operation of the Barley plant, the results would appear reasonably comparable providing some assurance that the measurement approach taken was appropriate.

## 4 Results

### 4.1 Sound Power

Source	Washer Motor 1	Germination CO2 Fan 1	Germination Intake Fans (Total)	Kiln Flue 1	Kiln Flue 2	Kiln Flue 3
Measured level ( $L_{Aeq,T}$ )	93	71	64	85	78	76
Period T (seconds)	26	35	74	22	49	62
Residual level ( $L_{Aeq,T}$ )	61	55	52	69	69	69
Period T (seconds)	20	10	27	27	27	27
Residual Correction	0	0	0	0	-1	-1
Measurement distance (m)	1	1	11 <sup>1</sup>	1	1	1
<b>Sound Power (LWA)</b>	<b>104 dB</b>	<b>82 dB</b>	<b>96 dB</b>	<b>96 dB</b>	<b>88 dB</b>	<b>86 dB</b>

### 4.2 Octave band spectra

Octave band (A weighted)	Washer Motor 1 (dB)	Germination CO2 Fan 1 (dB)	Germination Intake Fans (dB)	Kiln Flue 1 (dB)	Kiln Flue 2 (dB)	Kiln Flue 3 (dB)
63 Hz	65	60	75	73	71	69
125 Hz	72	63	81	79	75	71
250 Hz	88	69	85	94	89	88
500 Hz	95	78	89	96	86	82
1 kHz	101	76	93	93	86	81
2 kHz	98	75	84	92	81	76
4 kHz	95	69	79	82	71	67
8 kHz	86	58	69	70	61	58

### 4.3 Assessment positions

Results are shown in dB(A) and give decibel reductions attributed to spherical divergence, directivity and attenuation by atmospheric absorption and barriers. The noise level of the individual sources is summed to produce a worst case scenario and compared with the relevant criterion.

<sup>1</sup> Distance to notional centre of source given that the lower fans will dominate when measured from ground level

### 4.3.1 Peasiehill Cottages

Peasiehill Cottages	Washer Motor 1	Washer Motor 2	Germ CO2 Fan 1	Germ CO2 Fan 2	Upper intake fans	Lower Intake fans	Kiln Flue 1	Kiln Flue 2	Kiln Flue 3
Sound Power	104	104	82	82	93	93	96	88	86
Horizontal Distance (m)	275	278	288	307	306	306	240	236	231
Divergence	-60	-60	-60	-61	-61	-61	-59	-58	-58
Directivity - D	0	0	-5	-5	-8	-8	0	0	0
A <sub>air</sub>	-2	-2	-1	-1	-1	-1	-1	-1	0
ISO A <sub>barrier</sub>	-25	-25					-17	-16	-15
Nominal A <sub>barrier</sub>	-15	-15	0	0	0	0	-5	-5	-5
Noise Level	27	27	16	15	23	23	31	24	23
<b>PHC Total</b>	<b>35</b>	<b>Criterion</b>	<b>39</b>						
PHC Exceedence	-4								

### 4.3.1 Patrick Allan Fraser Street

Patrick Allan Fraser Street	Washer Motor 1	Washer Motor 2	Germ CO2 Fan 1	Germ CO2 Fan 2	Upper intake fans	Lower Intake fans	Kiln Flue 1	Kiln Flue 2	Kiln Flue 3
Sound Power	104	104	82	82	93	93	96	88	86
Horizontal Distance (m)	252	255	261	279	254	254	210	215	220
Divergence	-59	-59	-59	-60	-59	-59	-57	-58	-58
Directivity	0	0	-5	-5	-5	-5	0	0	0
A <sub>air</sub>	-2	-2	-1	-1	-1	-1	-1	-1	0
ISO A <sub>barrier</sub>	-25	-25				-17			
Nominal A <sub>barrier</sub>	-15	-15	0	0	0	-5	0	0	0
Noise Level	28	28	17	16	28	23	38	29	28
<b>PAF Total</b>	<b>40</b>	<b>Criterion</b>	<b>35</b>						
PAF Exceedence	5								

## 5 Discussion

The sound power levels computed meet the daytime criterion for Peasiehill Cottages by a margin of 4dB. Meanwhile, the daytime criterion for Patrick Allan Fraser St is exceeded by a margin of 5dB; the cause of non-compliance can clearly be identified as Kiln Flue 1, estimated to be 9dB louder than any other relevant source at the off-site assessment position. The worst case levels in each case meet the night-time noise criterion.

Although care has been taken to minimise error, measurement uncertainty should be considered alongside the results shown. The most significant sources of error are considered to be the potential instability of sound pressure measurements made in the near field of the noise source and in the estimation of distance measurements. Total measurement uncertainty is given by taking the 'root mean square' of independently contributing factors.

Factor	Value (dB)
Source near field	1.5
Estimated distances	1.0
Class 1 SLM tolerance	0.7
<b>Total measurement uncertainty</b>	<b>1.9</b>

Barrier attenuation in each case was ascribed a nominal value and therefore has a significant margin for error, but it should be noted that; a) the ISO calculated attenuation in all cases is at least 10dB greater than the nominal value ascribed, b) the result shown at Patrick Allen Fraser St is not dependent on barrier attenuation.

## 6 Conclusions

This assessment clearly indicates a particular issue with Kiln Flue 1 which, even in isolation, is assessed to exceed the 35dB(A) daytime criterion. The gas heaters attached to Flues 1 and 3 are of the same type and are set to operate in tandem. Assuming that this was the case on the day of measurement, there would appear to be significant scope for noise abatement at Flue 1. By calculation it can be seen that if Flue 1 was to operate at the same level as Flue 3, the result would be a 4dB reduction in level at the assessment position giving a revised level of 36dB.

It is recommended that the flue mounts are inspected for signs of deterioration and any other differences between the mounting of the flues be noted. Vibration may be transmitted from the boiler to flue if the two are connected without isolation.

If gas consumption of the boilers is individually metered, it may be possible to determine whether boiler 1 is working harder than boiler 3, allowing adjustment if necessary.

## 7 Appendix

### 7.1 Path difference calculations

#### 7.1.1 Peasiehill Cottages

Path difference	Washer Motor 1	Washer Motor 2	Germ CO2 Fan 1	Germ CO2 Fan 2	Upper intake fans	Lower Intake fans	Kiln Flue 1	Kiln Flue 2	Kiln Flue 3
Horizontal distance	275	278	288	307	306	306	240	236	231
Source height	3	3	34	34	14	4.6	18	18	18
Receiver height	4	4	4	4	4	4	4	4	4
Slant distance	275	278	290	308	306	306	240	236	231
Barrier distance	10	10			1	1	25	25	25
Barrier height	15	15			20	20	22	22	22
Barrier length	75	75			100	100	25	25	25
Path difference	5.9	5.9			5.5	15.1	0.8	0.8	0.8

#### 7.1.2 Patrick Allan Fraser St

Path difference	Washer Motor 1	Washer Motor 2	Germ CO2 Fan 1	Germ CO2 Fan 2	Upper intake fans	Lower Intake fans	Kiln Flue 1	Kiln Flue 2	Kiln Flue 3
Horizontal distance	252	255	261	279	254	254	210	215	220
Source Height	3	3	34	34	14	4.6	18	18	18
Receiver height	4	4	4	4	4	4	4	4	4
Slant distance	252	255	263	281	254	254	210	215	220
Barrier distance	10	5				5			
Barrier height	15	15				7			
Barrier length	20	20				10			
Path difference	5.9	8.3				0.6			



Green Cat Renewables

**BAIRDS MALT  
WIND TURBINE**

**NOISE - 14/01067/FULL**

**Noise Assessment Addendum**

December 2015

Green Cat Renewables Ltd





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**Noise Assessment Prepared for:**

Bairds Malt Ltd

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## **BAIRDS MALT WIND TURBINE**

**Prepared By:** Merlin Garnett

**14/01067/FULL**

### **Noise Assessment Addendum**



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December 2015

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Work\Bairds Malt\C0621-163 Bairds Malt Background  
Noise\Reporting\Bairds Malt Turbine Addendum v1.0.docx

Checked By: <b><i>Merlin Garnett</i></b>	Date: 16/12/2015
Approved By: <b><i>Cameron Sutherland</i></b>	Date: 16/12/2015

## 1 Executive Summary

Concern was raised that the high background levels measured during the noise monitoring exercise conducted in support of the turbine application *14/01067/FULL* may not be typical. Further that the high levels may be due to noise generated by the maltings while in breach of noise conditions.

A noise assessment was conducted to establish whether the plant operating under Condition 5 of the noise management plan was in compliance with those limits. An exhaust flue associated with the operation of the kiln at the maltings was found to be operating at higher than expected levels which contributed to a cumulative level at Patrick Allan Fraser Street in breach of Condition 5.

This assessment has investigated the potential impact of kiln noise on the background noise levels measured in January and February 2014 at Patrick Allan Fraser Street. The assessment concluded that, while noise attributable to the kiln produced a measurable increase in background levels, the increase was not sufficient to materially affect the outcome of the assessment; that predicted turbine noise is shown to meet calculated constraints by a comfortable margin.

The impact of noise produced by the steep-house on the background noise levels measured at Peasiehill Cottages was also investigated as a 'worst case' scenario. Again, the impact was measurable but did not affect the outcome of the assessment.

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## 2 Introduction

Following the submission of planning application 14/01067/FULL for a single wind turbine at Bairds Malt, Angus Council appointed an acoustic consultant (Dick Bowler) to review Green Cat Renewables' (GCRs') methodology. Of the seven points raised, all but Point 2 were addressed to the satisfaction of Angus Council within the 'Supporting Information' document that formed the response to Angus Council queries arising from Mr Bowler's independent review.

### Point 2

In response to Point 2 of the review, Angus Council requested that a noise assessment be conducted at the maltings to determine whether the plant subject to the operational noise limits set out in 'the noise management plan' was operating within those limits; Point 2 is given below:

***2) The existing maltings site generates relatively high levels of noise when compared to the normal rural location for a wind turbine. As background noise levels are used to derive appropriate criteria for the assessment of wind turbine noise in line with ETSU-R-97; the assessment and rating of noise from wind farms (ETSU-R-97) it is important to ensure that the data used is typical. The applicant's consultant has taken reasonable steps to ensure this is the case. They have not however done an assessment to ensure that the existing operations are complying with the extant noise limits applicable to the maltings site to ensure that existing operations are within limits. It is requested that the applicant carry out an appropriate assessment of this aspect.***

Documentation provided by Environmental Health<sup>1 2</sup> covers the equipment consented under 08/00469/FUL and installed during 2009. Condition 5 states:

*"That noise arising from plant associated with the proposed development as detailed in drawing GC19677-00-006 shall not exceed the following noise limits:*

- a) Between 0700 and 2200hrs and as determined in accordance with the procedure contained in BS4142 35 dB(A)  $L_{eq,1hour}$  at 103-107 Patrick Allan Fraser Street and 39 dB(A)  $L_{eq,1hour}$  at Peasiehill Cottages*
- b) Between 2200 and 0700hrs and as determined in accordance with the procedure contained in BS8233 45 dB(A)  $L_{max}$  or 35 dB(A)  $L_{eq,5mins}$  within any bedroom."*

08/00469/FUL included a new kiln complex incorporating two large diameter cylinder structures and the grain driers.

A compliance assessment was conducted in consultation with Angus Council that reported in November 2015. The assessment found that an exhaust flue associated with the kiln complex was operating above expected levels. By calculation, the flue was shown to result in a breach of the 35 dB(A)  $L_{eq,1hour}$  limit relevant to the properties at 103-107 Patrick Allan Fraser Street (PAFS). Bairds Malt Ltd has carried out some modifications to the flue fans since the compliance assessment and has requested that the noise level of this equipment be tested again; scheduled for early January 2016.

<sup>1</sup> FULL PLANNING PERMISSION APPROVAL Ref: 08/00469/FUL

<sup>2</sup> site plan 08\_00469.pdf

Following the submission of the compliance assessment, Angus Council requested that the background noise data, measured during January 2104 in support the turbine application, be re-examined to assess whether the levels measured at PAFS could have been unduly elevated; should the exhaust flue have been operating in breach of Condition 5 at the time. After some initial investigation of the 2014 background data, a method was proposed to Angus Council that would remove all the influence of noise associated with the kiln from the measured background levels whether the plant was in breach of the limit or not; the kiln may legitimately contribute to background levels so long as it operates within Condition 5. The approach was considered by Angus to be sufficiently conservative to put the issue beyond doubt and the investigation proceeded on that basis.

### Steep House

Angus Council raised a separate query during the compliance assessment when it was requested that, in order to assess a 'worst case' scenario of the impact of turbine noise on the residents of Peasiehill Cottages (PHC), the influence of the steep-house on background levels measured at this location be assessed and removed from the background levels measured in January 2014. The resulting background levels would then be representative of the quietest few weeks of the year when the steep-house was not in operation and would allow an assessment of turbine noise under these conditions to be made. The steep-house does not operate under Condition 5 (above).

## 3 Method

### Assessing kiln noise

The operational schedule of the kiln is regular and predictable: active at all times other than for a 12 hour period during every other night from ~21:30 until 09:30 the next morning, when operation resumes. This 48 hour cycle is repeated for 365 days per year.

Night hours relevant to the noise limits for the proposed turbine are: 23:00 until 07:00. Given the above schedule, it was established with a high degree of certainty that the kiln was active and then inactive during successive night hours during the January 2014 background noise survey. Background data measured between 23:00 and 07:00 was divided into two sets, those measured during odd or even numbered days as they occurred following the start of the noise monitoring period; day 1 being the 15<sup>th</sup> January 2014.

The two sets of noise data, plotted against standardised 10m wind speeds, were compared to establish whether the operation of the kiln was apparent in the measured data. The difference between the two data was deemed to be attributable to noise from the kiln ( $L$ ) and found through logarithmic subtraction of the lower background trend ( $L_2$ ) from the higher ( $L_1$ ), thereby correcting for other sources making up the ambient noise environment. It should be noted that the logarithmic subtraction method, given below, is unreliable where the level difference between trends reduces below ~1.5dB. Level difference was greatest in the absence of wind driven sources that dominate at higher wind speeds.

Equation 1: 
$$L = 10 \log_{10} \left( 10^{\frac{L_1}{10}} - 10^{\frac{L_2}{10}} \right)$$



Data measured during the nights when the kiln was inactive were deemed to represent the revised night hours background trend from which a night hours noise constraint for the proposed turbine was calculated. Noise levels measured during quiet daytime hours, that were assumed to include a component of kiln noise, were corrected for attributable kiln noise by subtracting that level from the established trend values at each integer wind speed by logarithmic subtraction. Quiet daytime criteria were then calculated from the new values inclusive of the downward adjustment. Predicted turbine noise was then re-assessed against the revised criteria. The implications of kiln noise on background noise measurements at the other three monitoring positions was considered.

The above analysis focussed on data already filtered for wind directions downwind of the proposed turbine location as the direction of the kiln flues corresponded well with that of the proposed turbine relative to the noise monitoring position at PAFS. Once the kiln noise level was established, this level was also subtracted from omni-directional backgrounds and the tabulated results reported.

### Assessing steep house noise

From the perspective of PHC, noise from the steep-house is barrier attenuated by the steep-house structure. Noise from the steep-house was measured during a site visit on the 20<sup>th</sup> October 2015. An assessment position at the western boundary of the site at a position between the steep-house and PHC was established. The on-site assessment position was selected to be representative of the barrier attenuated noise level leaving the site in the direction of PHC.

**Figure 1** shows the nearest steep-house fans (circled in blue) in relation to the cottages at Peasiehill. The fans face in a downward direction, limiting the scope for the reflection of noise by nearby buildings.



**Figure 1** – Steep house fans in relation to Peasiehill Cottages.

Once the assessment position was established, measurements were made of the prevailing noise levels. After a few minutes the steep-house fans were activated and allowed to run at full capacity while a second set of measurements were made. Extraneous noises, visible in the time histories and

evident in the audio recording, were eliminated from both measurements and the  $L_{eq,T}$  of the steep-house at the on-site assessment position determined through logarithmic subtraction.

A distance correction was then applied to the  $L_{eq,T}$  on the basis of geometric divergence from a point source to determine the level of the steep-house at the January 2014 noise monitoring position. A 2dB reduction in level was applied to the  $L_{eq,T}$  level so that a comparison could be made with the established  $L_{90,10minutes}$  background trends following the same procedure as for predicted turbine noise. This  $L_{90}$  level was then deducted from the omni-directional background trend values at integer  $v_{10}$  wind speeds, measured at PHC during January 2014, resulting in revised trend values from which to calculate revised constraints.

Predicted turbine noise levels were assessed against the revised criteria, the result being representative of a 'worst case' scenario rather than one that could be described as typical. This scenario is therefore offered as additional information but should not replace the previous assessment of turbine noise levels at PHC.

## 4 Results

### Kiln Noise

**Table 1** sets out the calculation process to determine the level of the kiln noise within the data measured during night hours and its removal from quiet daytime data.

**Table 1 – Calculation of kiln noise level**

Standardised 10m wind speeds ( $ms^{-1}$ )	4	5	6	7	8	9	10	11	12
Night hours Kiln on (dB(A) – $L_{90,10min}$ )	41.9	42.3	42.9	43.7	44.8	46.2	47.7	49.5	51.3
Night hours Kiln off (dB(A) – $L_{90,10min}$ )	39.5	40.2	41.2	42.4	44.1	46.0	48.0	49.7	50.8
Night hours Level difference (dB)	-2.4	-2.1	-1.7	-1.3	-0.7	-0.2	0.2	0.2	-0.5
Kiln Level (dB(A) – $L_{90,10min}$ )	38.1	38.1	38.1	37.8	36.7	32.1	-	-	41.4
Quiet Daytime hours (dB(A) – $L_{90,10min}$ )	42.3	42.7	43.3	44.2	45.5	47.0	48.7	50.4	51.8
Revised Quiet Daytime hours (dB(A) – $L_{90,10min}$ )	40.2	40.8	41.7	43.0	44.6	46.4	48.4	50.2	51.7
Resulting Quiet Daytime Level difference (dB)	-2.1	-1.9	-1.6	-1.2	-0.9	-0.6	-0.4	-0.3	-0.2

Where level difference is greater than 1.5dB, the results show a very consistent  $L_{90}$  level of 38.1dB(A). As the wind speed increases, wind driven noise sources dominate, limiting the level difference between data sets and resulting in levels for kiln noise that are unreliable.

The  $L_{90}$  level attributable to the kiln is established as 38.1dB(A) which is broadly consistent with the results of the compliance assessment. This level is deducted from the measured quiet daytime values at integer  $v_{10}$  wind speeds giving the revised quiet daytime trend shown in Table 1. The revision produces a maximum reduction of 2.1dB at  $4ms^{-1}$ . 'Night Hours Kiln Off' is now deemed to represent the night hours levels in the absence of kiln noise.

The following figures and associated tables show the measured  $L_{A90,10min}$  background noise levels and predicted turbine levels as a function of  $v_{10}$  wind speeds. The data are represented by best fit polynomial regression functions from which the noise limits are derived. The figures show the predicted turbine noise levels in relation to the derived limits.

Figure 2 shows background levels, calculated constraint and predicted turbine noise levels for PAFS during night-time hours.

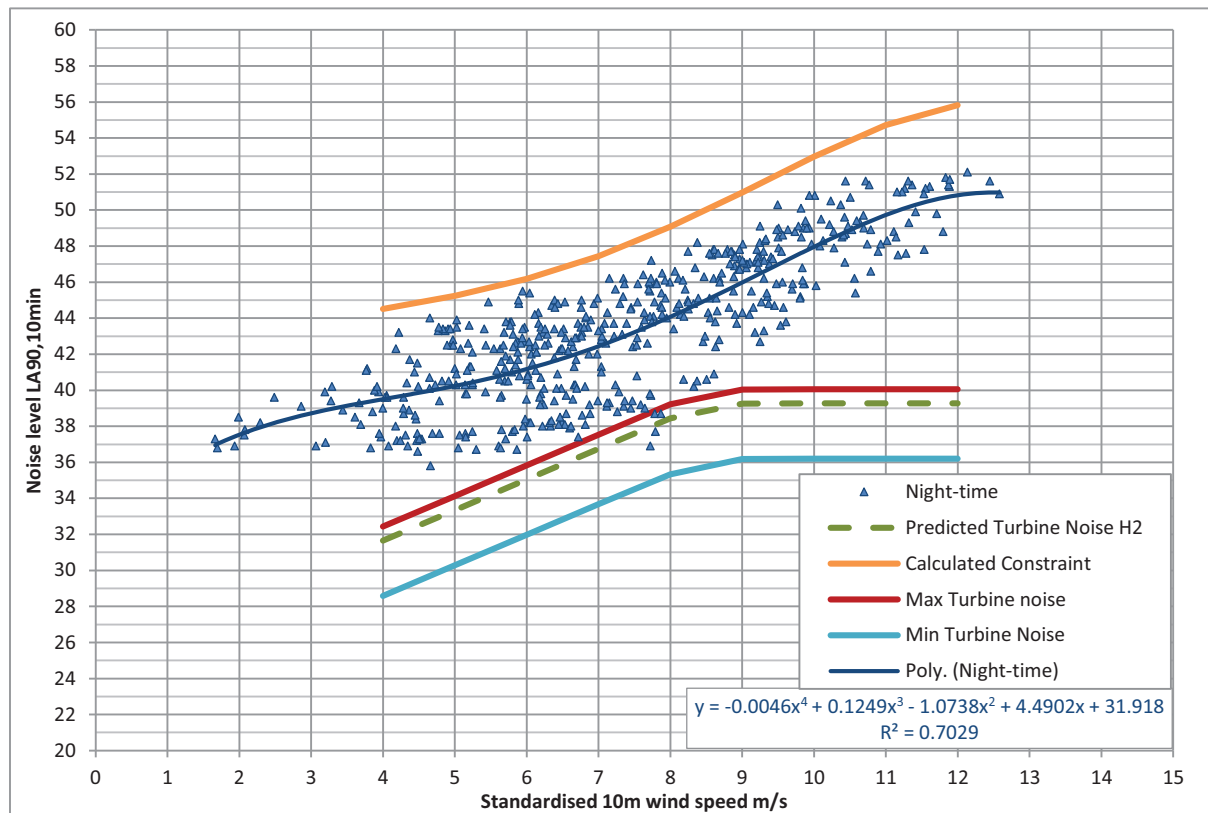


Figure 2 – Background levels, calculated constraint and predicted turbine noise levels for PAFS during night-time

Table 1 shows the tabulated results for PAFS during night time hours.

Table 2 - Background levels, calculated constraint and predicted turbine noise levels for PAFS during night-time.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Background Noise										
Number of values (total)	(478)	38	50	98	73	62	74	44	27	12
Average value L <sub>A90,10min</sub>	dB(A)	39.5	40.2	41.2	42.4	44.1	46.0	48.0	49.7	50.8
Calculated Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	44.5	45.2	46.2	47.4	49.1	51.0	53.0	54.7	55.8
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	32.4	34.1	35.8	37.5	39.2	40.0	40.1	40.1	40.1
Level Difference										
Exceedence	dB(A)	-12.1	-11.1	-10.3	-9.9	-9.9	-11.0	-12.9	-14.7	-15.8

Figure 3 shows background levels, revised background trend with calculated constraint and predicted turbine noise levels for PAFS during quiet daytime hours.

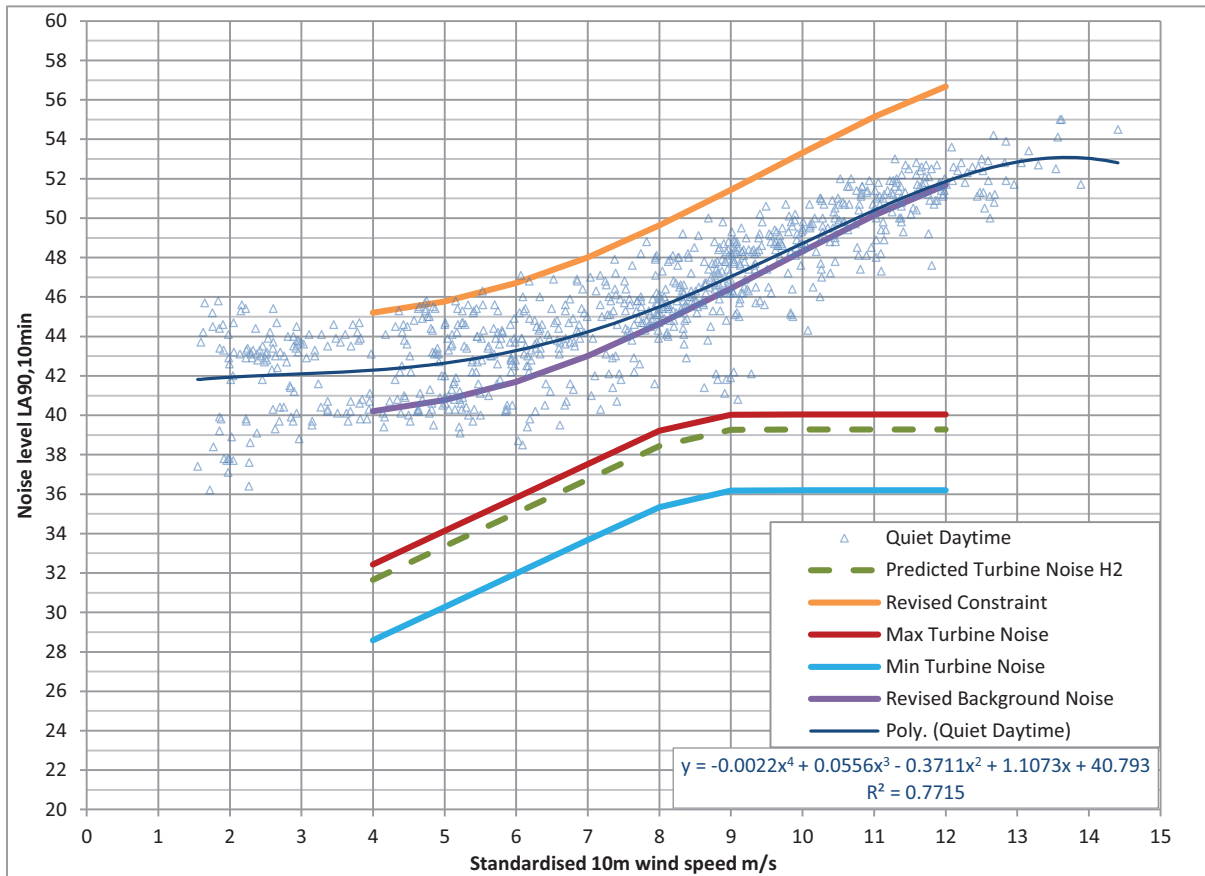


Figure 3 - Background levels, revised constraint and predicted turbine noise levels for PAFS during quiet daytime

Table 2 shows the tabulated results for PAFS during quiet daytime.

Table 3 - Background levels, calculated constraint and predicted turbine noise levels for PAFS during quiet daytime

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Revised Background Noise										
Number of values (total)	(478)	38	50	98	73	62	74	44	27	12
Average value L <sub>A90,10min</sub>	dB(A)	40.2	40.8	41.7	43.0	44.6	46.4	48.3	50.1	51.7
Revised Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	45.2	45.8	46.7	48.0	49.6	51.4	53.3	55.1	56.7
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	32.4	34.1	35.8	37.5	39.2	40.0	40.1	40.1	40.1
Level Difference										
Exceedence	dB(A)	-12.8	-11.6	-10.9	-10.5	-10.4	-11.4	-13.3	-15.1	-16.6

Predicted turbine noise is shown to meet the revised criteria by a comfortable margin.

### Impact of kiln noise on other monitoring locations.

The compliance assessment found that the plant subject to the noise management plan was operating within Condition 5 at PHC. Noise from Exhaust Flue 1, found to be producing elevated levels at PAFS, was assessed to produce 31dB(A)  $L_{eq,1hour}$  at PHC. This level, being more than 10dB below the  $L_{90}$  background trends for both night and quiet daytime hours, is deemed not to have made any significant impact on background levels measured at PHC.

On the Hospitalfield estate, noise from the kiln was assessed to produce 38.1dB(A)  $L_{90,10min}$  at the noise monitoring position at PAFS. Taking Exhaust Flue 1 as the nominal noise source position representative of the kiln, relative distances are established and the  $L_{90,10min}$  level at the other two noise monitoring positions calculated assuming:

$$\text{Equation 2 - } L_2 = L_1 - 20 \text{ Log } (R_2/R_1).$$

Where  $L$  is the noise level at distance  $R$  from the noise source, and are shown in **Table 4**.

**Table 4 – Positions and their distances from the kiln**

Location	Easting	Northing	Distance from kiln (m)	Kiln Noise ( $L_{90,10min}$ )
Exhaust Flue 1	361787	740197	-	-
H2-PAF St (mon pos)	361843	740432	242	38.1
H3-Kinghorn St (mon pos)	361872	740615	427	33.2
H4-Gerrard St (mon pos)	362049	740525	420	33.3

It should be noted that the above levels are representative of kiln noise as a whole, rather than that portion of kiln noise deemed to be in breach of Condition 5, and does not include any barrier or atmospheric attenuation. However, to maintain a consistent and conservative approach to that adopted for PAFS, the background trends measured at Kinghorn St and Gerrard St were also revised downwards to remove the noise levels deemed attributable to the kiln by logarithmic subtraction at integer  $v_{10}$  wind speeds.

**Table 5** summarises all resulting adjustments to background levels resulting from the removal of kiln noise.

**Table 5 – Effect of removal of kiln noise on background noise trends**

Standardised $V_{10}$ wind speeds	$ms^{-1}$	4	5	6	7	8	9	10	11	12
H1 Night	dB	0	0	0	0	0	0	0	0	0
H1 Quiet Day	dB	0	0	0	0	0	0	0	0	0
H2 Night	dB	-1.4	-1.1	-0.7	-0.5	-0.2	0.1	0.2	-0.1	-0.7
H2 Quiet Day	dB	-2.1	-1.9	-1.6	-1.2	-0.9	-0.6	-0.4	-0.3	-0.2
H3 Night	dB	-1.3	-1.2	-1.0	-0.9	-0.6	-0.5	-0.3	-0.2	-0.2
H3 Quiet Day	dB	-1.1	-0.9	-0.7	-0.6	-0.4	-0.3	-0.2	-0.2	-0.1
H4 Night	dB	-2.3	-1.7	-1.2	-0.8	-0.6	-0.4	-0.3	-0.2	-0.2
H4 Quiet Day	dB	-1.4	-1.1	-0.8	-0.6	-0.5	-0.3	-0.2	-0.2	-0.1

## Revised noise assessment

**Table 6** shows revised exceedence of worst case turbine noise for all locations; no lower fixed limit has been applied when calculating constraints.

**Table 6 – Exceedence of maximum predicted turbine noise from revised constraints**

Standardised 10m wind speeds	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
H1 Night	dB	-15.9	-14.4	-13.0	-11.9	-11.1	-11.4	-12.8	-14.6	-16.8
H1 Quiet Day	dB	-17.4	-16.0	-14.8	-13.9	-13.3	-13.7	-15.0	-16.3	-17.6
H2 Night	dB	-12.1	-11.1	-10.3	-9.9	-9.9	-11.0	-12.9	-14.7	-15.8
H2 Quiet Day	dB	-12.8	-11.6	-10.9	-10.5	-10.4	-11.4	-13.3	-15.1	-16.6
H3 Night	dB	-13.5	-12.4	-11.3	-10.6	-10.2	-10.9	-12.7	-14.4	-16.0
H3 Quiet Day	dB	-14.6	-13.7	-12.9	-12.4	-12.0	-12.6	-14.1	-15.5	-16.7
H4 Night	dB	-10.2	-10.4	-10.4	-10.3	-10.2	-10.8	-12.2	-13.6	-15.2
H4 Quiet Day	dB	-13.0	-12.6	-12.1	-11.7	-11.4	-12.1	-13.5	-15.0	-16.2

The results shown in **Table 6** are on the basis of adjustments to the background trends detailed in the noise assessment accompanying the planning application. They do not therefore include the marginal differences in noise level presented in the ‘supporting information’ response between the downwind background trends and omni-directional background trends. Those differences may be applied to the results shown in **Table 6** such that exceedence from omni-directional background derived constraints be calculated; shown in **Table 7**.

**Table 7 - Exceedence of maximum predicted turbine noise from omni-directional constraints**

Standardised 10m wind speeds	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
H1 Night	dB	-15.0	-13.3	-11.8	-10.8	-10.2	-10.8	-12.5	-14.5	-16.7
H1 Quiet Day	dB	-16.8	-15.1	-13.6	-12.6	-12.0	-12.6	-14.1	-15.7	-17.4
H2 Night	dB	-11.9	-11.2	-10.3	-9.8	-9.8	-10.9	-13.0	-14.9	-16.0
H2 Quiet Day	dB	-12.4	-11.3	-10.7	-10.4	-10.3	-11.4	-13.3	-15.1	-16.6
H3 Night	dB	-13.2	-12.4	-11.3	-10.6	-10.2	-10.9	-12.7	-14.5	-16.1
H3 Quiet Day	dB	-14.1	-13.3	-12.6	-12.1	-11.8	-12.5	-14.1	-15.5	-16.7
H4 Night	dB	-9.5	-10.1	-10.1	-10.0	-10.0	-10.8	-12.5	-14.1	-15.5
H4 Quiet Day	dB	-12.9	-12.6	-12.1	-11.7	-11.3	-12.0	-13.5	-15.0	-16.2

Predicted turbine noise is shown to meet all the revised criteria by a comfortable margin.

## Amenity assessment

An amenity assessment formed part of the response to Mr Bowdlers comments that assumed the following BS4142-1997 scenario: That predicted turbine noise  $L_{eq}$  levels with an additional 5dB character correction be assessed against  $L_{90}$  background levels. This effectively increases the values in **Table 7** by 7dB and results in the values given in **Table 8**:

**Table 8 - Amenity assessment**

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
H1 Night	dB	-8.0	-6.3	-4.8	-3.8	-3.2	-3.8	-5.5	-7.5	-9.7
H1 Quiet Day	dB	-9.8	-8.1	-6.6	-5.6	-5.0	-5.6	-7.1	-8.7	-10.4
H2 Night	dB	-4.9	-4.2	-3.3	-2.8	-2.8	-3.9	-6.0	-7.9	-9.0
H2 Quiet Day	dB	-5.4	-4.3	-3.7	-3.4	-3.3	-4.4	-6.3	-8.1	-9.6
H3 Night	dB	-6.2	-5.4	-4.3	-3.6	-3.2	-3.9	-5.7	-7.5	-9.1
H3 Quiet Day	dB	-7.1	-6.3	-5.6	-5.1	-4.8	-5.5	-7.1	-8.5	-9.7
H4 Night	dB	-2.5	-3.1	-3.1	-3.0	-3.0	-3.8	-5.5	-7.1	-8.5
H4 Quiet Day	dB	-5.9	-5.6	-5.1	-4.7	-4.3	-5.0	-6.5	-8.0	-9.2



**Table 8** shows that under this scenario, turbine noise meets the criteria by a minimum of 2.5dB.

### Steep House

**Figure 4** shows the relative positions of the steep-house fans (**A**), the on-site assessment position (**B**) and the noise monitoring position at PHC (**C**).



**Figure 4 – Steep house fans, assessment position and noise monitoring position at PHC**

Relative distances (*R*) are given in **Table 9**. The steep-house fans are estimated to be a maximum of 20m above both the on-site assessment position and the noise monitoring position at PHC. Given the proximity of the assessment position to the fans, slant distances were calculated and used to adjust noise level for distance in the calculations that follow (a larger distance from A to B implies a higher noise level at C).

**Table 9 – Positions and separation distances**

Location	Easting	Northing	Distance <i>R</i> from fans (m)	<i>R</i> slant distance (m)
Steep fans (nearest fan)	361686	740200	-	-
PHC Proxy for steep fans	361657	740199	29	35
PHC (mon pos)	361546	740192	140	142
PAF (mon pos)	361843	740432	280	281

**Figure 5** shows the time history of noise levels measured in two 1/3 octave bands over a period of about 5 minutes at the on-site assessment position. The 63Hz plot provided a clear indication of the point in time that the steep-house became active; typical levels increasing at 29:27. The 6.3kHz plot proved to be particularly sensitive to noise produced by the pellet manufacturing process that was intermittently active at the time of measurement, and assisted with the identification and removal of affected data. These events and other less prominent features of the noise environment were also cross referenced with the audio recording such that all significant extraneous noise was removed from the analysis.

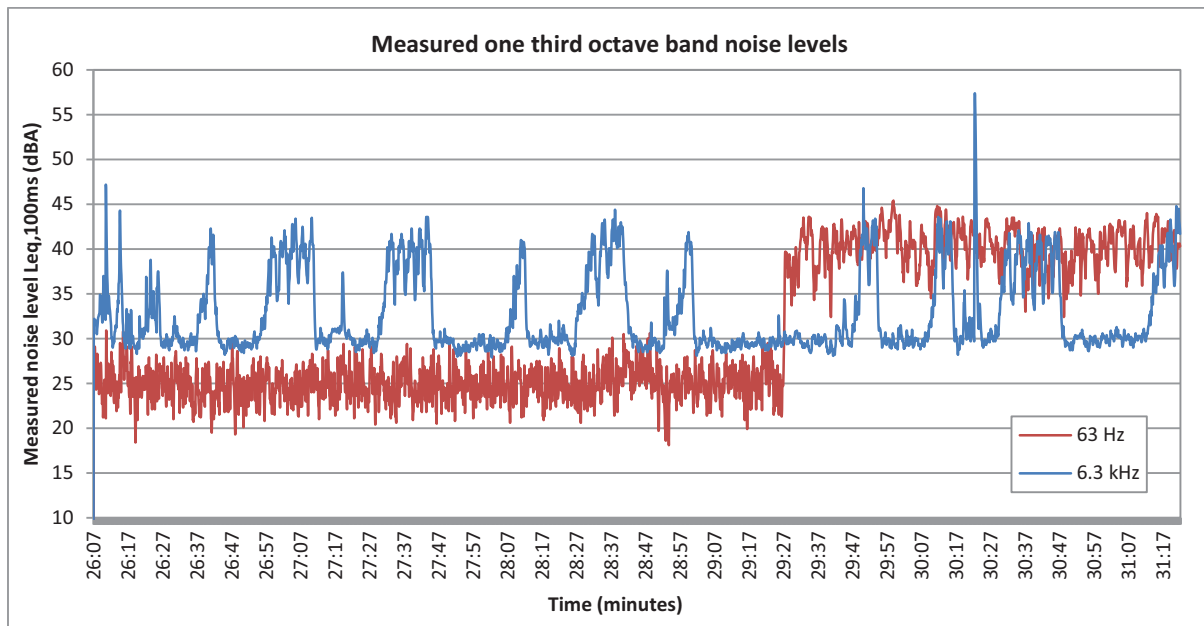


Figure 5 – Time history

A logarithmic average was calculated from the remaining  $L_{eq,100ms}$  data, measured before and after the activation of the steep-house, and the noise level deemed attributable to the fans obtained via logarithmic subtraction; given in **Table 10**.

Table 10 – Calculation of steep-house noise level

Measure	$L_{eq,T}$	T (seconds)
Residual Noise (dBA)	54.1	71
Operational Noise (dBA)	56.1	70
Level difference (dB)	2.0	-
Steep-house Noise (dBA)	51.8	-

**Table 10** shows the level of steep-house noise reaching the noise monitoring position at PHC adjusted for distance using equation 2; a 2dB reduction in the conversion of  $L_{eq,T}$  to  $L_{90,10min}$  is assumed. Equivalent levels for PAFS are also included for information; this level is a minimum of 7.5dB below the revised background trend and therefore deemed not to be a significant component of data measured at PAFS.

Table 11 – Calculation of steep-house noise at noise monitoring positions

Location	Slant distance R (m)	$L_{eq,T}$ (dBA)	$L_{90}$ (dBA)
Steep fans (nearest fan)	-	-	-
Assessment Position	35	51.8	49.8
PHC (mon pos)	142	39.6	37.6
PAF (mon pos)	281	33.7	31.7

The steep-house is assessed to produce 37.6dB(A)  $L_{90,10min}$  at the noise monitoring position at PHC. To assess predicted turbine noise in the absence of steep-house noise, this level is logarithmically subtracted from the omni-directional  $L_{90,10min}$  background trends providing the following analysis.

**Figure 6** shows background levels, revised background trend with calculated constraint and predicted turbine noise levels for PHC during night hours.

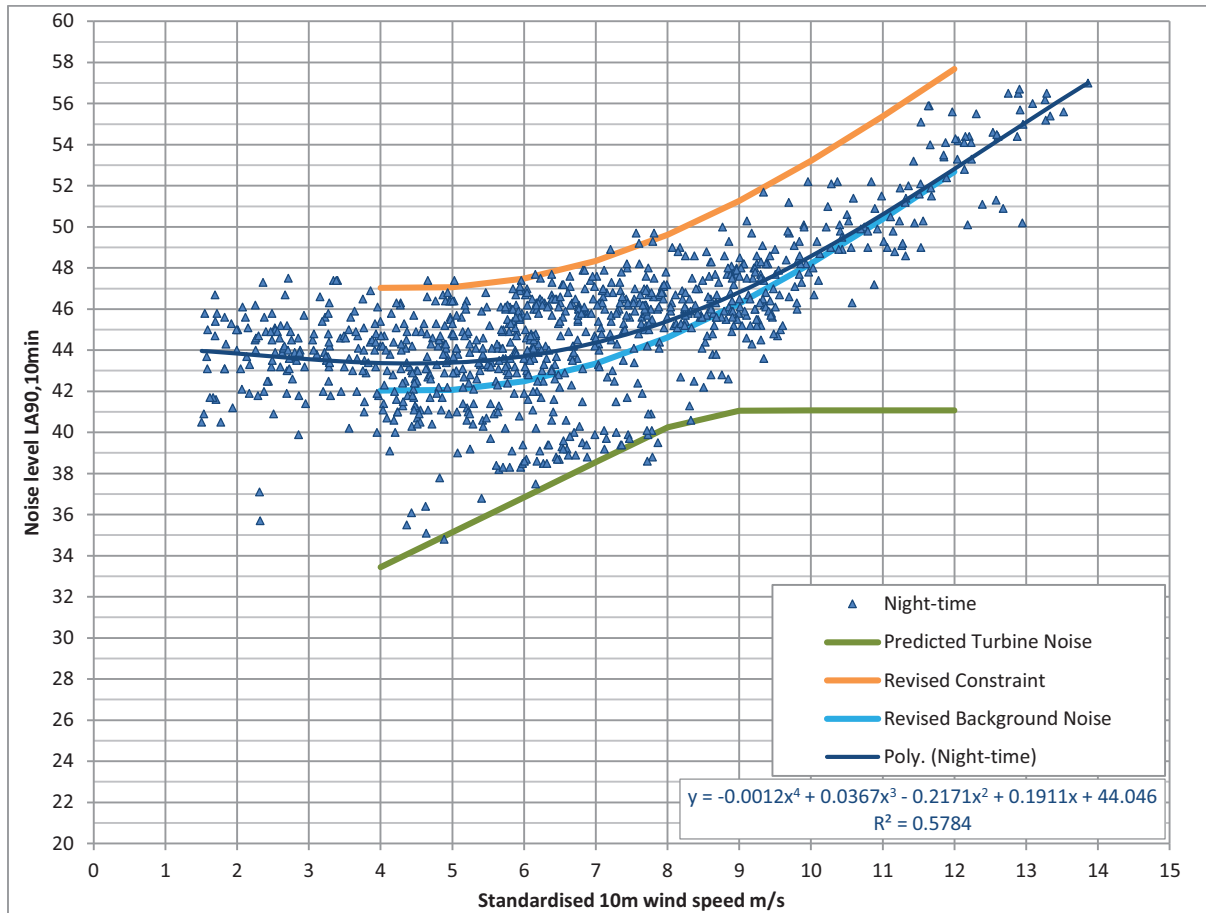


Figure 6 - background levels, revised background trend with calculated constraint and predicted turbine noise levels for PHC during night hours

Table 12 shows the tabulated results for PHC during night time hours.

Table 12 - Tabulated results for PHC during night time hours

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Revised Background Noise										
Number of values (total)	(805)	90	116	166	121	107	107	42	29	27
Average value LA90,10min	dB(A)	42.0	42.1	42.5	43.3	44.6	46.3	48.2	50.4	52.7
Revised Constraint										
Average value LA90,10min	dB(A)	47.0	47.1	47.5	48.3	49.6	51.3	53.2	55.4	57.7
Max Predicted Turbine Noise										
Average value LA90,10min	dB(A)	33.4	35.1	36.8	38.5	40.2	41.1	41.1	41.1	41.1
Level Difference										
Exceedence	dB(A)	-13.6	-11.9	-10.6	-9.8	-9.4	-10.2	-12.1	-14.3	-16.6

Figure 6 shows background levels, revised background trend with calculated constraint and predicted turbine noise levels for PHC during night hours.

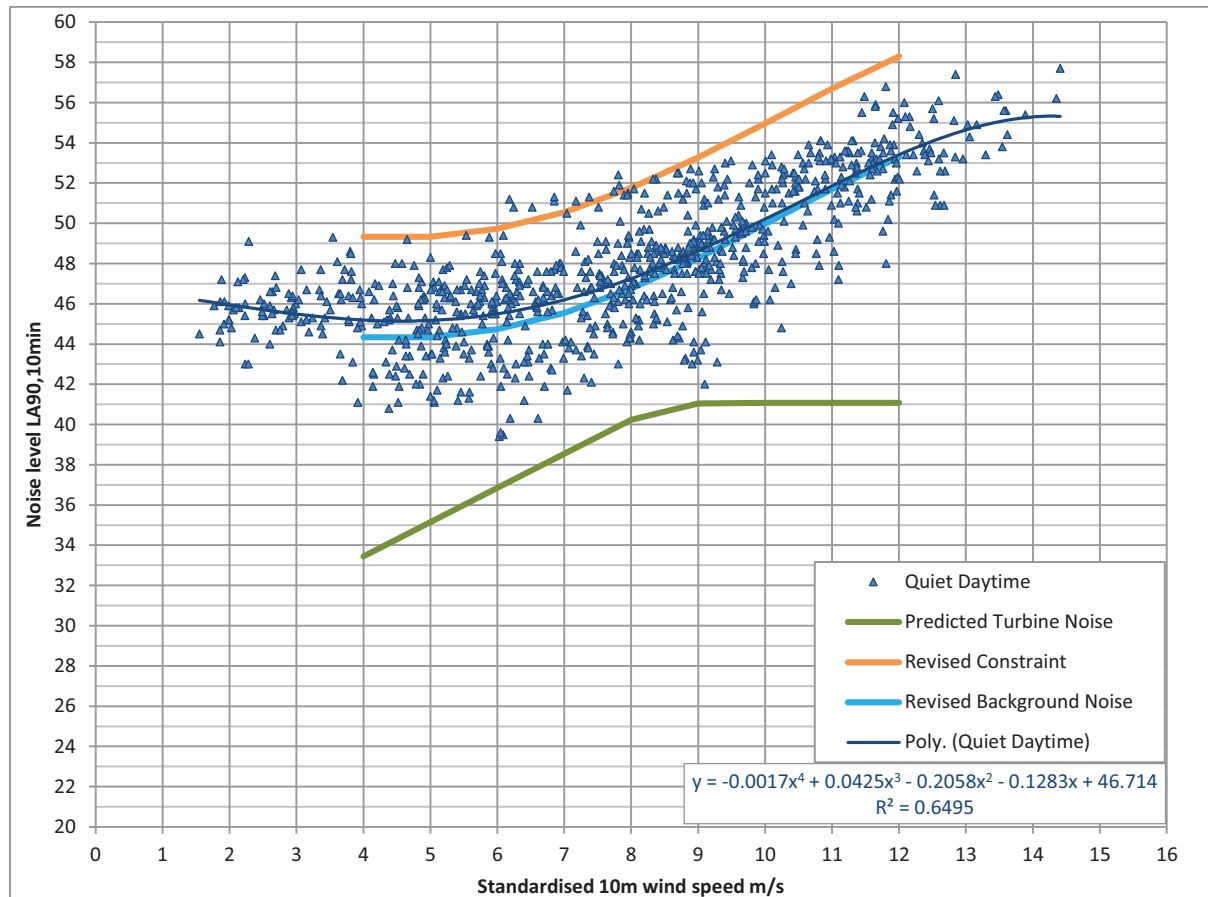


Figure 7 - background levels, revised background trend with calculated constraint and predicted turbine noise levels for PHC during quiet daytime

Table 13 shows the tabulated results for PHC during quiet daytime.

Table 13 - Tabulated results for PHC during quiet daytime

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
Reference electric power	kW	63	133	232	372	543	699	803	866	902
Revised Background Noise										
Number of values (total)		737	50	86	96	73	116	122	76	67
Average value L <sub>A90,10min</sub>	dB(A)	44.3	44.3	44.7	45.5	46.8	48.3	50.0	51.7	53.3
Revised Constraint										
Average value L <sub>A90,10min</sub>	dB(A)	49.3	49.3	49.7	50.5	51.8	53.3	55.0	56.7	58.3
Max Predicted Turbine Noise										
Average value L <sub>A90,10min</sub>	dB(A)	33.4	35.1	36.8	38.5	40.2	41.1	41.1	41.1	41.1
Level Difference										
Exceedence	dB(A)	-15.9	-14.2	-12.9	-12.0	-11.5	-12.2	-13.9	-15.6	-17.2

The impact of steep-house noise at PHC is greatest during night hours, but even then, its removal has not resulted in significantly change to the noise assessment.

## 5 Discussion

### Kiln Noise

The regularity of the kiln schedule provided an opportunity to assess noise levels produced by the kiln during night hours. The contribution of noise from the kiln was clearly apparent once ambient noise from other sources had been removed. Any noise produced by ancillary noise sources, should they operate in synchronisation with the kiln, would also be removed by the applied method; this would lead to an over estimate of kiln noise.

Confidence in the noise level calculated to be attributable to the kiln is gained from the consistency of the result across the lower integer  $v_{10}$  wind speeds; where level difference between operational and non-operational noise levels was greatest. The result of 38.1dB(A)  $L_{90,10min}$ , deemed to be equivalent to an  $L_{eq,1hour}$  of 40.1dB(A), is consistent with the results of the compliance assessment at PAFS and where kiln noise was assessed to be the dominant noise producing source of the plant listed under Condition 5.

The high level of consistency between the two separate measurement results supported the assertion that all noise associated with the operation of the kiln and its influence on measured background trends had been accounted for and that the revised background trends provided necessary basis for re-assessment that was demonstrably conservative.

### Steep House

Through measurement of the steep-house in relatively close proximity, a  $L_{90,10min}$  noise level was calculated to occur at the 2014 noise monitoring position at PHC. This level was removed from the omni-directional background noise trend providing a revised trend from which to calculate noise constraints. The steep-house has the following weekly schedule which was active during the 2014 noise monitoring period:

Mon 19:00 until Tues 15:00.  
Tues 21:00 until Weds 11:00.  
Thurs 14:00 until Fri 02:00.  
Fri 06:00 until Fri 12:00.

Effectively removing steep-house noise from all measured background data (from which the trends are derived) is therefore bound to provide a conservative assessment of its impact on the noise levels measured at PHC.

## 6 Conclusions

The levels assessed for the kiln and steep-house corroborate with the empirical experience of the noise environment in and around the maltings, in that:

- a) The plant that operates under Condition 5 appears to produce less noise than the pre-existing plant.
- b) It is difficult to pick out the contribution of individual plant from overall ambient noise when observing from the perspective of the noise monitoring positions at PAFS and PHC as

operational noise is largely produced by fans and therefore similar in nature and there are many of them.

More generally, it appears that the high background levels measured can be attributed to a large number of sources both on and off the site at Bairds and, while the removal of an individual source produces a measurable effect, no one source dominates. This diversity of masking sources (transport, coastline, industrial) means that it is less likely that all sources stop producing noise simultaneously, potentially allowing noise from the wind turbine to become audible above background noise.

The measured spectra of noise sources listed in the compliance assessment were dominant in the same octave bands (500Hz – 1kHz) as turbine noise is predicted to be and these sources therefore have the potential to provide efficient masking noise.

The removal of noise attributable to the kiln and steep-house from the background trend levels provide clarity that noise due to the operation of these sources does not significantly change the outcome of the assessment. This assessment concludes that predicted turbine noise meets all the revised constraints by a comfortable margin and further, that the concerns raised under Point 2 of the external review have been fully investigated; all other points were previously addressed.

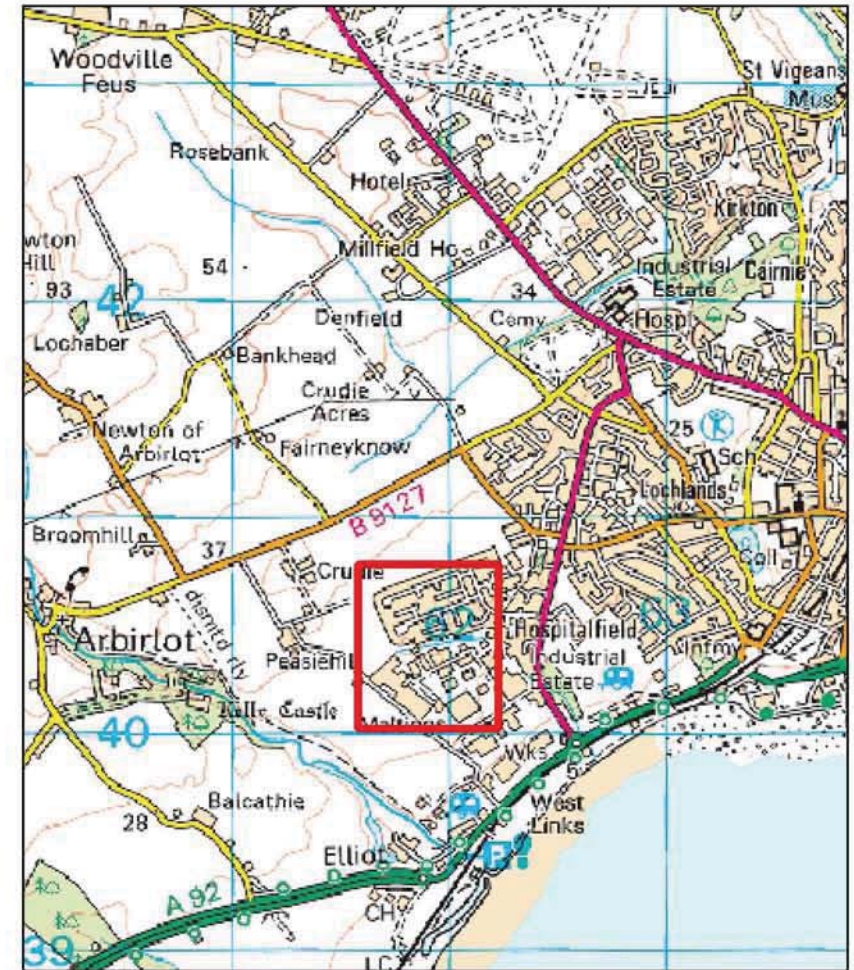


Baird's Malt, Arbroath

Table A and B Zones



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Green Cat Renewables

**BAIRDS MALT  
WIND TURBINE**

**NOISE - 14/01067/FULL**

**Supporting Information**

January 2016

Green Cat Renewables Ltd



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**Noise Assessment Prepared for:**

Bairds Malt Single Turbine Ltd

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## **BAIRDS MALT WIND TURBINE**

**Prepared By:** Merlin Garnett

**14/01067/FULL**

### **Supporting Information**



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January 2016

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Checked By: <b><i>Merlin Garnett</i></b>	Date: 12/01/2016
Approved By: <b><i>Cameron Sutherland</i></b>	Date: 12/01/2016

## 1 Introduction

Following the submission of planning application 14/01067/FULL for a single wind turbine at Bairds Malt, Angus Council appointed an acoustic consultant (Dick Bowdler) to review Green Cat Renewables' (GCRs') methodology. Following this, the Council requested further information in document: 14\_01067\_FULL-ENVIRONMENTAL\_HEALTH-2475903[1].pdf dated 17/04/2015.

## 2 Response

The points raised by Environmental Health are addressed in turn through the following sections.

### 1) The applicant is requested to provide the following additional information:

#### a) Calibration certificates for the sound level meters.

Calibration certificates have been submitted.

#### b) On site calibration and calibration drift records.

Location	SLM	17/01/2014	21/01/2014	29/01/2014	05/02/2014	19/02/2014
Peasie Hill Cottages	01283511	94.0	94.0	94.1	94.1	93.9
Gerrard St	00603864	94.0	94.0	94.0	94.1	94.0
Patrick Allan Fraser St	01283510	94.0	94.0	94.1	94.1	94.0
Kinghorne St	00903982	94.0	94.0	94.1	94.1	94.0

#### c) Manufacturers sound power levels used in the calculations.

Enercon E44	7	8	9	10+
Warrantied 55m	101.1	102.6	103.0	103.0
Octave Band (Hz)	Scaled 55m OB			
63	80.9	83.9	84.6	84.4
125	87.7	89.4	91.1	90.1
250	92.7	93.0	93.3	93.5
500	93.7	95.1	96.2	96.5
1000	95.0	97.1	97.7	97.6
2000	92.2	94.4	94.2	94.3
4000	85.5	87.1	86.9	87.0
8000	80.8	81.0	80.6	80.1

Predicted levels for lower wind speeds were obtained by extrapolating the typical reduction in predicted noise levels at the assessment positions between  $8\text{ms}^{-1}$  and  $7\text{ms}^{-1}$  e.g. at Peasiehill the prediction falls from 40.2dB(A) to 38.5dB(A). This rate of reduction (1.7dB) was then assumed for decreasing integer wind speeds. The approach is analogous to assuming a 1.5dB reduction that is obtained by subtracting the warrantied broadband values for 7 and  $8\text{ms}^{-1}$ ; 101.1dB(A) from 102.6dB(A). It should be noted that the most sensitive wind speed identified in the noise assessment for all locations is  $8\text{ms}^{-1}$ .



**2) The existing maltings site generates relatively high levels of noise when compared to the normal rural location for a wind turbine. As background noise levels are used to derive appropriate criteria for the assessment of wind turbine noise in line with ETSU-R-97; the assessment and rating of noise from wind farms (ETSU-R-97) it is important to ensure that the data used is typical. The applicant's consultant has taken reasonable steps to ensure this is the case. They have not however done an assessment to ensure that the existing operations are complying with the extant noise limits applicable to the maltings site to ensure that existing operations are within limits. It is requested that the applicant carry out an appropriate assessment of this aspect.**

A compliance assessment on behalf of Bairds Malt was submitted separately addressing this point. One element of the new plant was found to be in breach of criteria. The implications of the breach on measured background levels was fully investigated and reported in December 2015 via submitted document 'Noise Assessment Addendum'. The results of that investigation were given in table 5 – reproduced below.

**Table 1 – Effect of removal of kiln noise on background noise trends**

Standardised V <sub>10</sub> wind speeds	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
H1 Night	dB	0	0	0	0	0	0	0	0	0
H1 Quiet Day	dB	0	0	0	0	0	0	0	0	0
H2 Night	dB	-1.4	-1.1	-0.7	-0.5	-0.2	0.1	0.2	-0.1	-0.7
H2 Quiet Day	dB	-2.1	-1.9	-1.6	-1.2	-0.9	-0.6	-0.4	-0.3	-0.2
H3 Night	dB	-1.3	-1.2	-1.0	-0.9	-0.6	-0.5	-0.3	-0.2	-0.2
H3 Quiet Day	dB	-1.1	-0.9	-0.7	-0.6	-0.4	-0.3	-0.2	-0.2	-0.1
H4 Night	dB	-2.3	-1.7	-1.2	-0.8	-0.6	-0.4	-0.3	-0.2	-0.2
H4 Quiet Day	dB	-1.4	-1.1	-0.8	-0.6	-0.5	-0.3	-0.2	-0.2	-0.1

**3) No assessment has been made for properties to the south despite some of these being within the original 35dBA contour. An appropriate assessment is requested for these properties.**

The nearest noise sensitive part of the caravan park is 100m more distant than the nearest noise sensitive property to the north of Bairds Malt (PHC) and, consequently, predicted levels are 2.4dB lower.

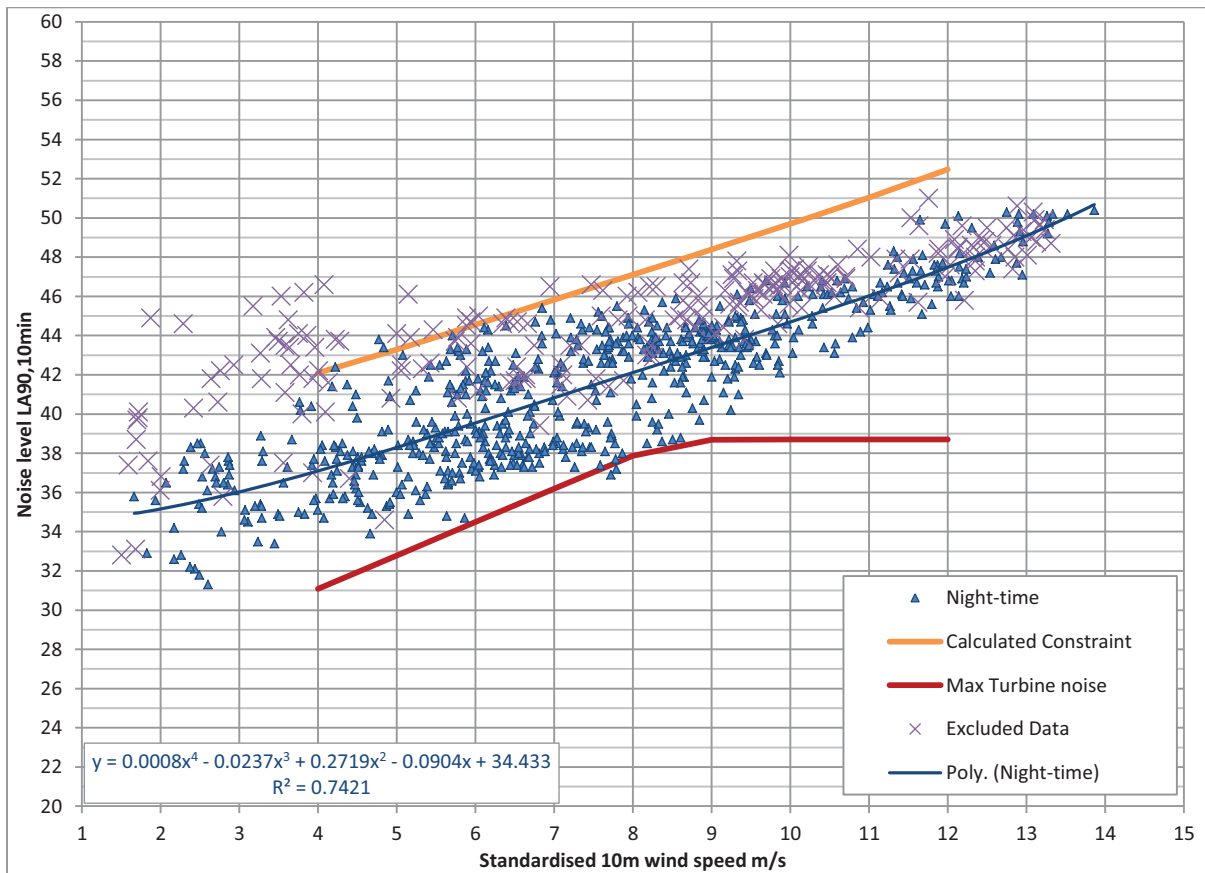
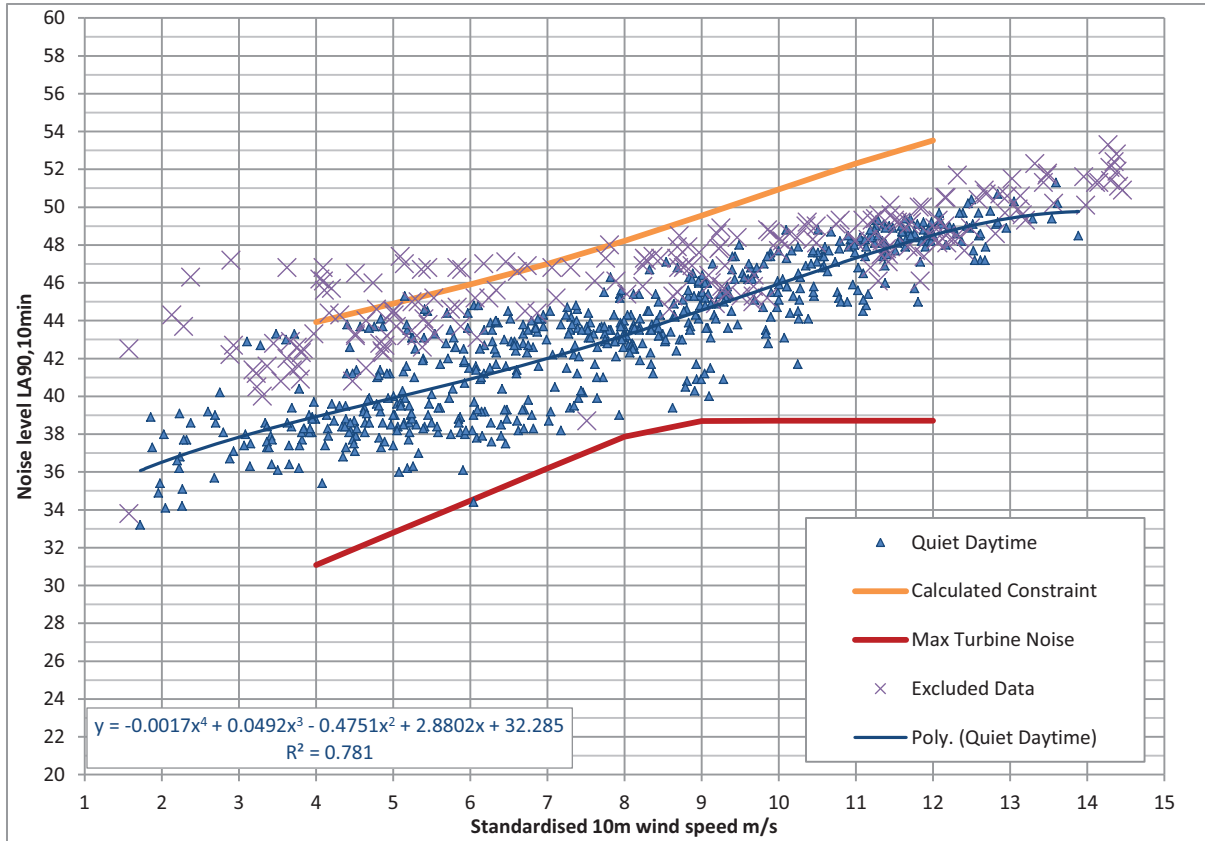
During measurements in and around the caravan park, L<sub>A90,1min</sub> levels of 40-45dB(A) were typical during the working day. Passing traffic registered an L<sub>A10,1min</sub> of 76dB during a typical weekday afternoon. Other than the busy A92, noise from the coastline and railway were observed. Measurements were also taken at various points along the track joining PHC with the caravan park on four separate occasions. At each end of the run of measurements, marked by the orange arrows, L<sub>A90,1min</sub> levels at PHC were typically between 2 and 4dB lower than those close to the caravan park.





The quietest backgrounds were measured at H4 – Gerrard Street where levels reached 31dB  $L_{A90,10min}$  under low wind conditions. This location is more distant from the sources that dominate the noise environment at the caravan park yet marginally nearer the maltings. H4 does benefit from some barrier attenuation of noise at the maltings which is not applicable at the caravan park. Therefore, H4 is deemed a suitable and potentially conservative proxy location to use in assessing predicted turbine noise at the caravan park.

The following plots assess worst case predicted turbine noise for the caravan park against the criteria derived at H4 – Gerrard Street for quiet daytime periods and night time periods respectively. Turbine noise is assessed to be more than 4dB below the measured background trend at all wind speeds. The detached properties south of the caravans lie on the 35dB(A) noise contour and could be subject to a standard 35dB(A) condition.



**4) It appears that the background noise data may have been filtered for wind direction but this is not clear. If the data has been filtered in this way potentially this will exclude quiet periods depending on wind directions that have been removed. It is requested that the applicant clarify this point giving full justification for any filtering.**

Measured background data was directionally filtered to include only data associated wind winds arriving from  $\pm 80^\circ$  from a line between the proposed turbine position and the monitoring position. These conditions were considered to be those most favourable for the propagation of turbine noise.

Propagation directivity is discussed in the Good Practice Guide<sup>1</sup> at section 4.4: Paragraph 4.4.2 suggests upwind reductions of at least 10dB and crosswind reductions of 2dB as per the 'Joule Project'. In practice, it is suggested that such reductions '...progressively come into play at distances of between 5 and 10 turbine tip heights'; in this case 220m – 440m. Peasiehill Cottages are the nearest properties at around 300m from the proposed turbine, so even here, diffraction effects are likely to be present during upwind conditions. The nearest properties on Patrick Allan Fraser street are ~350m from the turbine and the nearest caravans, ~400m.

For completeness, the data set was checked to see if omni-directional data was any quieter. The following table shows differences in the derived background trend between the directionally filtered data presented and the unfiltered, omni-directional data; negative values show where the omni data was quieter.

Standardised wind speed	ms <sup>-1</sup>	4	5	6	7	8	9	10	11	12
H1 Night	dB	-0.9	-1.1	-1.2	-1.1	-0.9	-0.6	-0.3	-0.1	-0.1
H1 Quiet Day	dB	-0.6	-0.9	-1.2	-1.3	-1.3	-1.1	-0.9	-0.6	-0.2
H2 Night	dB	-0.2	0.1	0.0	-0.1	-0.1	-0.1	0.1	0.2	0.2
H2 Quiet Day	dB	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0
H3 Night	dB	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
H3 Quiet Day	dB	-0.5	-0.4	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.0
H4 Night	dB	-0.7	-0.3	-0.3	-0.3	-0.2	0.0	0.3	0.5	0.3
H4 Quiet Day	dB	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0

Omni-directional background levels are marginally quieter at Peasiehill Cottages and broadly similar at other locations.

**5. The applicant has suggested that a daytime lower limit of 38db is used however no justification is given for this. A daytime lower limit of 36db is considered to be more appropriate taking into account the factors suggested in ETSU-R-97 especially the number of properties potentially affected and the effect on power generation. A re-assessment based on a daytime lower limit of 36db is requested.**

The following comments were made in support of an increase to the minimum 35dB(A) lower fixed limit in an email to environmental health on the 4<sup>th</sup> December 2013:

<sup>1</sup> Good Practice Guide on Wind Turbine Noise – IoA, May 2013, 4.4.2, p22

*'RE: p65 of ETSU-R-97....It is the level of exposure that presents the strongest argument in favour of a higher than minimum 35dB limit as the proportion of time that background noise levels are low is predicted to be small in the context of a typical year of operation. As can be seen from the data previously submitted that, even at what was considered to be an annual minimum, levels were rarely below 30dB(A) during amenity periods at either monitoring location and where average levels were above 36dB(A). This gives a strong positive indication that levels of exposure during amenity periods will be very limited especially during the more frequent periods where standardised 10m wind speeds are below 7ms<sup>-1</sup> given a typical coastal wind speed distribution.'*

Notwithstanding the above discussion, the developer would be willing to accept the recommended lower fixed limit of 36dB; applicable during quiet daytime periods. It has already been shown that the project would comply with the proposed lower fixed limit of 38dB(A) by at least 2dB(A), ensuring compliance with an amenity period 36dB(A) lower fixed limit.

***6. There is no assessment of the impact of the noise on the amenity of residents as required by policy ER35 of the Angus Local Plan Review. The comment on page 100 that there is a low likelihood of audibility is not robustly demonstrated. Factors such as amplitude modulation (swish) which will not start to fall off, either upwind or downwind of the turbine, until about 300m and the background noise tonal content will be influential in this. An assessment of the impact on residential amenity is requested.***

#### **WHO guidance on Community Noise**

The recommendation for the maximum internal night hours amenity level is 30dB  $L_{Aeq}$ . The façade of a property with an open window is deemed to provide at least 10dB attenuation. This leads to the adoption of a lower fixed night hours limit for external noise of 40dB  $L_{Aeq}$  or 38dB  $L_{A90,10min}$  rather than the 43dB  $L_{A90,10min}$  provision under ETSU-R-97. While turbine noise predictions show levels up to 3dB above 38dB  $L_{A90,10min}$ , these levels are predicted to occur when background noise rather than turbine noise is dominant.

#### **Likelihood of complaints**

Using BS4142:1997 methodology, an assessment can be made of whether complaints are likely in response to a particular industrial noise. The standard uses a penalty system that adds 5dB to noise sources that exhibit a tonal or impulsive noise character in determining the rating level of the noise source ( $L_{Aeq}$ ). The rating level is compared with the background noise level ( $L_{A90,10min}$ ) and consequently, exceedence is increased by 2dB relative to ETSU-R-97 (where  $L_{A90,10min}$  source is compared with  $L_{A90,10min}$  background).

#### **Turbine noise character**

Characteristics of turbine noise that have the potential to increase audibility or attract attention are tonality and amplitude modulation. Tonal noise has the potential to be audible if tones are sufficiently prominent. In document '*SA-04-SPL Guarantee E-44-Rev1\_2-ger-eng.pdf*' the turbine manufacturer states that '*A tonal audibility of  $\Delta L_{\alpha,k} < 2dB$  can be expected over the whole operational range (valid in the near vicinity of the turbine according to IEC 61400-11 ed.2).*' Tonal noise is therefore not considered to be a feature of this turbine.

Amplitude modulation (AM) is an integral feature of wind turbine noise that occurs at blade passing frequency due to the size and the motion of the noise producing elements of the turbine blades. There are however particular atmospheric conditions that may change the character and increase the AM depth of turbine noise; this phenomenon is referred to by the IoA as 'Other AM' or OAM and is not yet sufficiently well understood for a prediction of the likelihood of OAM occurring on a particular site to be made.

### **Assessment of amenity**

OAM is considered to be the result of atypical atmospheric conditions, so the scenario being assessed is an absolute worst case and likely to be uncommon if it occurs at all. A +5dB penalty is added to predicted levels as an OAM character penalty. This is consistent with RenewableUK's 'Template Planning Condition on Amplitude Modulation' that describes a method for determining whether site specific amplitude modulation warrants a penalty of up to 5dB; given in guidance note 3 and 4 and ascribed in a very similar way to penalties for audible tones under ETSU-R-97. In combination with the  $L_{Aeq}$  prediction for turbine noise; the cumulative effect is a 7dB increase relative to the submitted ( $L_{A90,10min}$ ) turbine noise levels.

### **Peasiehill Cottages**

The noise environment at PHC was observed to be strongly influenced by the activities at the maltings, but at times when this activity subsided, traffic noise from the A92 became noticeable. Constant residual lower level processes at the maltings appeared to prevent background levels reaching below 30dB  $L_{A90,10min}$ . The quietest background levels measured at Peasiehill were those during night-time hours when all wind directions were included.

Turbine noise levels exceed the background trend by a maximum of 1.8dB at  $8ms^{-1}$  and by 1.2dB at 7 and  $9ms^{-1}$ . These worst case exceedences are significantly less than 5dB which the method would determine was of marginal significance. Under this scenario, turbine noise may be audible though not prominent. Turbine noise does not exceed the background trend during daytime hours.

### **Patrick Allan Fraser Street**

The background noise environment around Patrick Allan Fraser St is influenced by activity from the industrial estate; noise sources observed include equipment incorporating electric motors, aerodynamic noise from fans and flues, vehicle movements and various intermittent impulsive noises. The underlying background noise was observed to be more energetic in the 250Hz – 500Hz octave bands than is typical of a rural environment therefore turbine noise can be expected to be masked more effectively being weighted towards these octave bands.

The amenity assessment for the nearest property on Patrick Allan Fraser street is comparable to Peasiehill Cottages showing a 2.1dB exceedence of the night hours background trend at  $8ms^{-1}$  with more marginal exceedence for integer wind speeds 6, 7 and  $9ms^{-1}$ . Turbine noise exceeds the background trend by a maximum of 0.8dB during daytime hours. These results are also below those described as being of marginal significance.

The nearest properties to the turbine represented by background levels at Kinghorne street and Gerrard street show exceedence of background trend of 1.2dB and 1.4dB respectively for night hours and -0.3dB and 0.2dB respectively for daytime hours. These levels are also assessed as being of less than marginal significance.

### **Caravan Park**

Road and rail traffic were prominent at the caravan park along with a backdrop of wave noise from the shoreline that became more noticeable from time to time. As stated under question 2 above, measurements taken at the site indicated that background levels at the caravan park were 2 - 4dB louder than Peasiehill Cottages. However, so that amenity can be assessed at the park during quieter periods, the background levels measured at H4 have again been used as a conservative proxy with the same justifications.

The amenity assessment for the nearest caravan on the park is a 2.8dB exceedence of the night hours background trend at  $8\text{ms}^{-1}$  and a maximum exceedence of 1.7dB during daytime hours. These results are also below those described as being of marginal significance.

### **Factors affecting the occurrence of amplitude modulation**

OAM appears to occur during conditions when either wind shear is particularly high and/or the wind has high turbulence intensity. Under these conditions, the turbine blades cannot maintain optimal performance over their entire rotation causing increased trailing edge noise. High wind shear and high turbulence intensity most commonly occur as a result of the interaction of obstacles causing drag on the air column moving over it. Wind shear also occurs more at night when vertical wind components are at a minimum, causing atmospheric stratification above the boundary layer.

The buildings at the maltings to the north of the proposed turbine location are likely to have the most significant effect on wind shear at the site. The buildings are expected to affect winds arriving from approximately  $315^\circ - 60^\circ$ . Wind arriving from the east to south west ( $60^\circ - 225^\circ$ ) are expected to be relatively low, largely arriving from seaward directions where wind shear is low due to the lack of obstacles. The remaining directions ( $225^\circ - 315^\circ$ ) are typical of a rural site consisting of relatively flat farmland with occasional trees, the nearest of which are more than 10 rotor diameters to the west and therefore not likely to have a significant influence on wind shear.

The potential for OAM will be mitigated on-site by the prevailing wind conditions which will arrive at the turbine from across the firth and therefore can reasonably be expected to exhibit relatively low wind shear and turbulence. On the other hand, winds arriving from directions  $315^\circ - 60^\circ$  are much less frequent. Higher wind shear tends to occur at night when residents are likely to be indoors, reducing the likelihood of them being disturbed by noise.

The Enercon E44 is a Class I machine meaning that it is designed to cope with a more extreme range of conditions than are likely to occur on this site. It can be argued that this should lower the probability of OAM occurring. The size of the rotor is also a factor, larger rotors tend to encounter more OAM due to the large range of atmospheric conditions they sweep through on each rotation; in this case the 44m diameter rotor is relatively small. Should OAM be found to occur at the site,



Green Cat Renewables has experience of making adjustments to the operations of turbines of this scale such that the frequency of occurrence is significantly reduced and the modulation depth of OAM reduced to levels deemed to be acceptable under current guidance.

**7. The land west of the proposed turbine has been granted planning permission for the formation of a new business park (11/00428/FULM). No assessment of the impact of turbine noise on potential business use has been reported in the ER and the applicant is requested to carry this out including taking into account amplitude modulation (swish) and any possible mitigation.**

Assessment work submitted to the Council on 04/06/2013 via email in regard to the business park concluded that, due to the high noise levels from the maltings currently observed on the border with the consented business park, sound insulation and mechanical ventilation would be required if any office space was to be located there such that internal noise levels were within recommended limits.

It was calculated that the turbine may increase noise levels here by ~3dB (worst case). In the context of the existing noise sources, any additional noise insulation required to mitigate turbine noise would be minor (equating to an increase of 3dB in the insulation specification (SRI) of building facades). Dick Bowdler draws a similar conclusion: *“This might make the closest of the adjacent site marginally less attractive to some users but I do not think, bearing in mind there is already noise of a similar level from Bairds at times, the impact would be significant.”*

Factors affecting the occurrence of higher amplitude modulation depth are covered under point 6. Should amplitude modulation occur at an unacceptable level, the mitigation described under point 6 could equally be applied in this case, if required.

### 3 Summary

Criteria are required that reflect the revisions under points 2 and 4. These were obtained by combining the adjustments and applying these to the directionally filtered background curves as submitted in the noise assessment. The resulting criteria are shown below:

Revised night-hours criteria.

Standardised wind speed	ms-1	4	5	6	7	8	9	10	11	12
Peasiehill Cottage	dB(A)	48.4	48.4	48.7	49.4	50.4	51.8	53.6	55.6	57.8
Patrick Allan Fraser	dB(A)	44.3	45.3	46.2	47.3	49.0	50.9	53.1	54.9	56.0
Kinghorne	dB(A)	42.4	43.2	43.9	44.8	46.2	47.7	49.5	51.3	52.8
Gerrard	dB(A)	39.1	41.3	43.0	44.7	46.3	48.0	49.7	51.3	52.6

Revised quiet daytime criteria.

Standardised wind speed	ms-1	4	5	6	7	8	9	10	11	12
Peasiehill Cottage	dB(A)	50.2	50.2	50.4	51.2	52.2	53.7	55.2	56.8	58.4
Patrick Allan Fraser	dB(A)	44.8	45.4	46.5	47.9	49.5	51.4	53.3	55.1	56.7
Kinghorne	dB(A)	43.3	44.2	45.2	46.3	47.8	49.3	50.9	52.2	53.5
Gerrard	dB(A)	42.4	43.8	45.1	46.4	47.6	49.1	50.7	52.1	53.4

The above criteria do not include a lower fixed limit.

For completeness, the following exceedence of the above criteria reflects the most conservative option under Point 1c (which assumes a 1.5dB reduction in sound power per integer wind speed for standardised 10m wind speeds below 7ms<sup>-1</sup>).

Night hours exceedence.

Standardised wind speed	ms-1	4	5	6	7	8	9	10	11	12
Peasiehill Cottage	dB(A)	-14.4	-12.9	-11.6	-10.8	-10.2	-10.8	-12.5	-14.5	-16.7
Patrick Allan Fraser	dB(A)	-11.3	-10.7	-10.2	-9.8	-9.7	-10.9	-13.1	-14.8	-15.9
Kinghorne	dB(A)	-10.2	-9.5	-8.7	-8.0	-7.7	-8.4	-10.2	-12.1	-13.5
Gerrard	dB(A)	-9.9	-10.6	-10.9	-11.1	-11.0	-11.8	-13.5	-15.1	-16.4

Quiet daytime exceedence.

Standardised wind speed	ms-1	4	5	6	7	8	9	10	11	12
Peasiehill Cottage	dB(A)	-16.2	-14.7	-13.4	-12.6	-12.0	-12.6	-14.1	-15.7	-17.4
Patrick Allan Fraser	dB(A)	-11.8	-10.9	-10.4	-10.4	-10.3	-11.4	-13.3	-15.0	-16.6
Kinghorne	dB(A)	-11.0	-10.4	-10.0	-9.5	-9.3	-10.0	-11.6	-12.9	-14.2
Gerrard	dB(A)	-13.2	-13.1	-12.9	-12.7	-12.3	-13.0	-14.5	-15.9	-17.2

Although not considered typical, criteria for Peasiehill derived in the absence of Steepphouse noise are given in the 'Noise Assessment Addendum'.

# Bairds Malt Wind Turbine Landscape Figures

to accompany

## Bairds Malt Wind Turbine Environmental Report

### Chapter 7: Landscape and Visual Impact

for



**Bairds malt**

Bairds Malt Single Turbine Ltd.



Green Cat Renewables

# Bairds Malt Wind Turbine Landscape Figures

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7.11c	CZTV to Tip Height with 35km Radius – Greenhillock (Consented)	7.27	VP-15 View from St Andrews
7.11d	CZTV to Tip Height with 35km Radius – Stotfaulds (Consented)	7.28	VP-16 View from White Caterthun



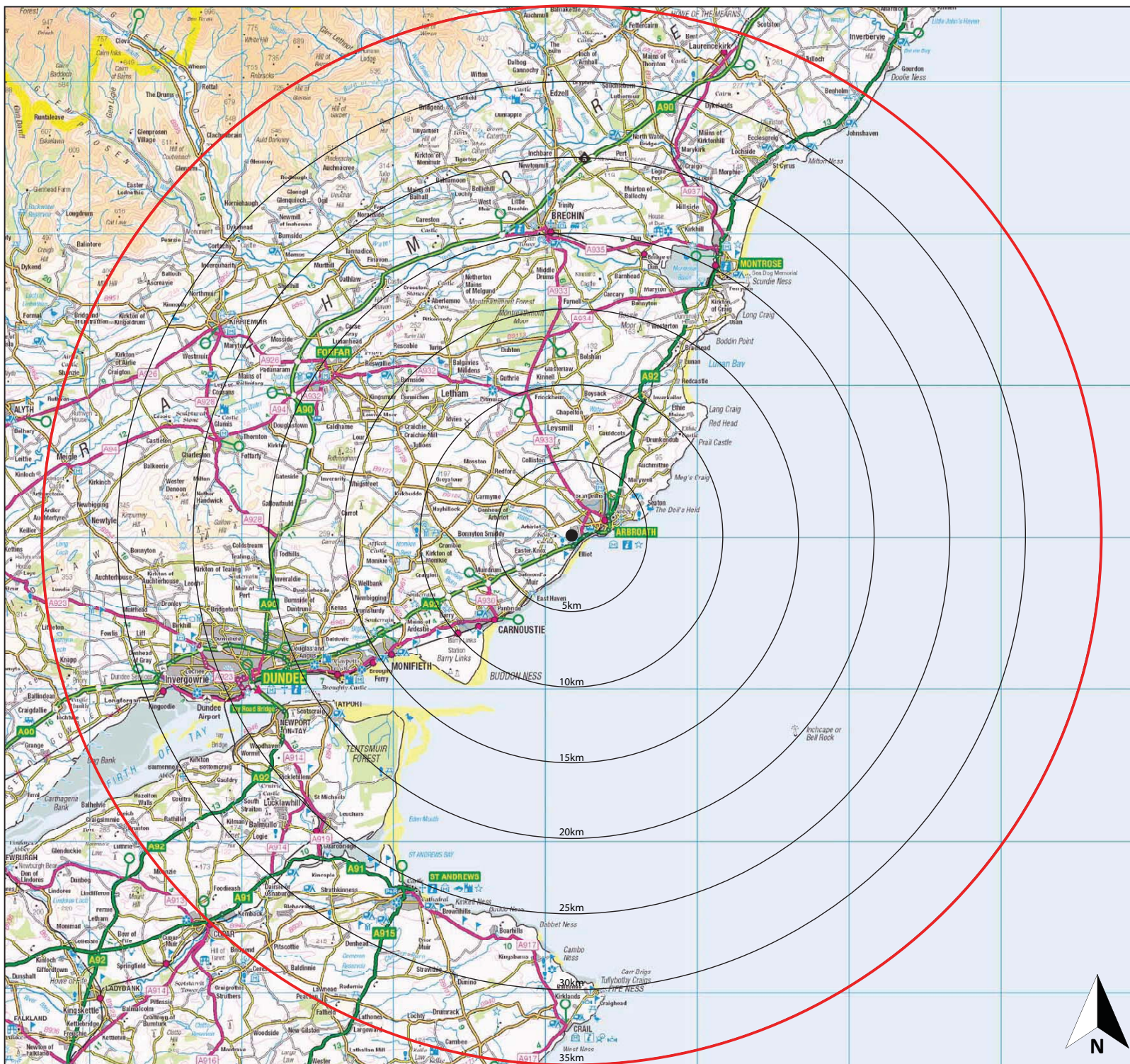
Projects Name: Bairds Malt Single Wind Turbine

Document Title: Study Area

Scale: 1:250,000 @ A3

Key:

- Proposed Turbine Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)



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Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/Fig 7.1  
Version: 1.0  
Author: SS  
Checked by: RC  
Approved By: GM  
Date: 17/12/2014



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Scale: **1:250,000 @ A3**

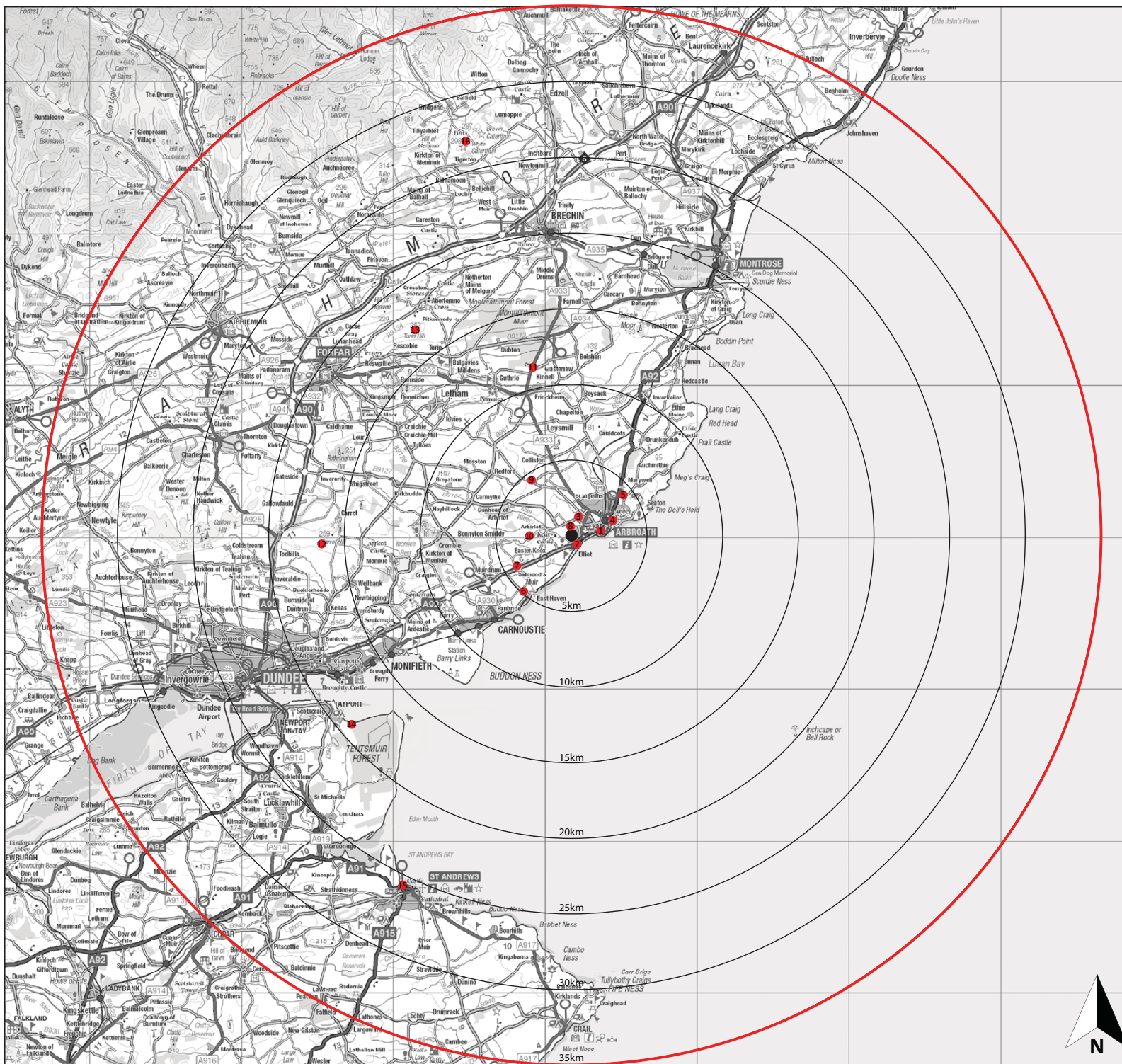
Key:

- Proposed Turbine Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)

● Viewpoint Locator & Identifier

Viewpoint Name:

- 1 - Queen's Drive, Arbroath
- 2 - Elliot Bridge
- 3 - Arbirlot Road West
- 4 - Boulzie Hill
- 5 - Bearfauld Road
- 6 - East Haven
- 7 - A92, Salmond's Muir
- 8 - Patrick Allan Fraser Street
- 9 - Firthfield
- 10 - Braemore
- 11 - A933 Montreathmont
- 12 - Dodd Hill
- 13 - Turin Hill
- 14 - Tentsmuir Recreational Area
- 15 - St Andrews
- 16 - White Caterthun



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.2**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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Projects Name: **Bairds Malt Single Wind Turbine**  
 Document Title: **Landscape Character Types surrounding Bairds Malt**  
 Scale: **1:250,000 @ A3**

- Key:**
- Proposed Turbine Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)

**Landscape Character Types:**

**Tayside Landscape Assessment:**

<b>1a</b>	Coast with Sand	<b>6</b>	Highland Foothills
<b>1b</b>	Coast with Cliffs	<b>7</b>	Igneous Hills
<b>2</b>	Broad Valley Lowlands	<b>8</b>	Mid Highland Glens
<b>3</b>	Firth Lowlands	<b>9</b>	Highland Summits & Plateaux
<b>4</b>	Low Moorland Hills	<b>10</b>	Upper Highland Glens
<b>5</b>	Dipslope Farmland	<b>11</b>	Lowland Basins

**Fife Landscape Assessment:**

<b>1</b>	Coastal Hills	<b>6</b>	Lowland Sloping Farmland
<b>2</b>	Coastal Terrace	<b>7</b>	Upland Foothills
<b>3</b>	Coastal Flats	<b>8</b>	Volcanic Hills & Craigs
<b>4</b>	Lowland Dens	<b>9</b>	Lowland Glacial Meltwater Valleys
<b>5</b>	Lowland Hills & Valleys		

**South & Central Aberdeenshire Landscape Assessment:**

<b>1</b>	Kincardine Links
<b>2</b>	Garvock & Glenbervie
<b>3</b>	Howe of the Mearns
<b>4</b>	The Mounth

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**Client: Bairds Malt Single Turbine Ltd**

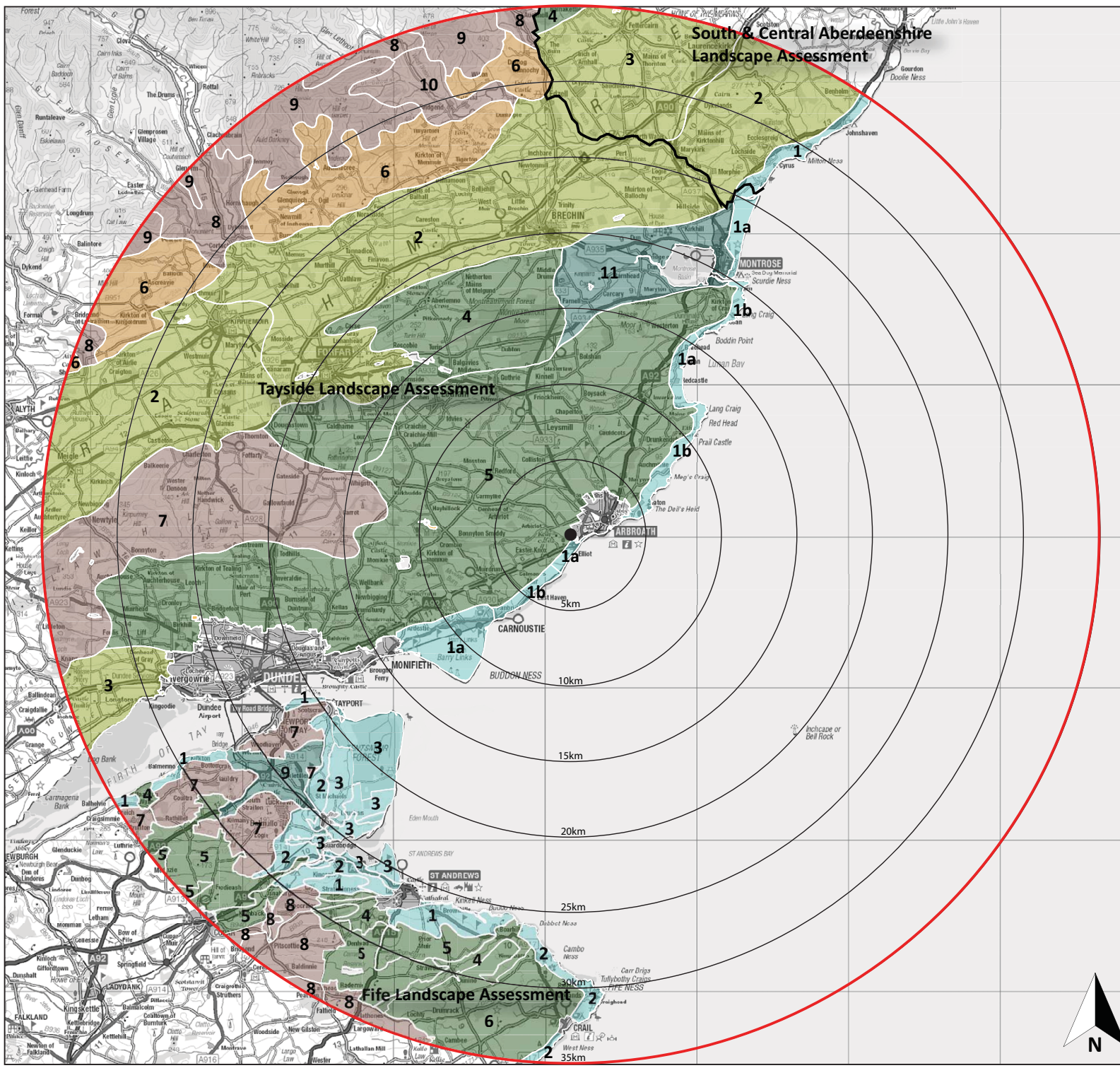


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Document Number: **C0621-163/Fig 7.3**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**



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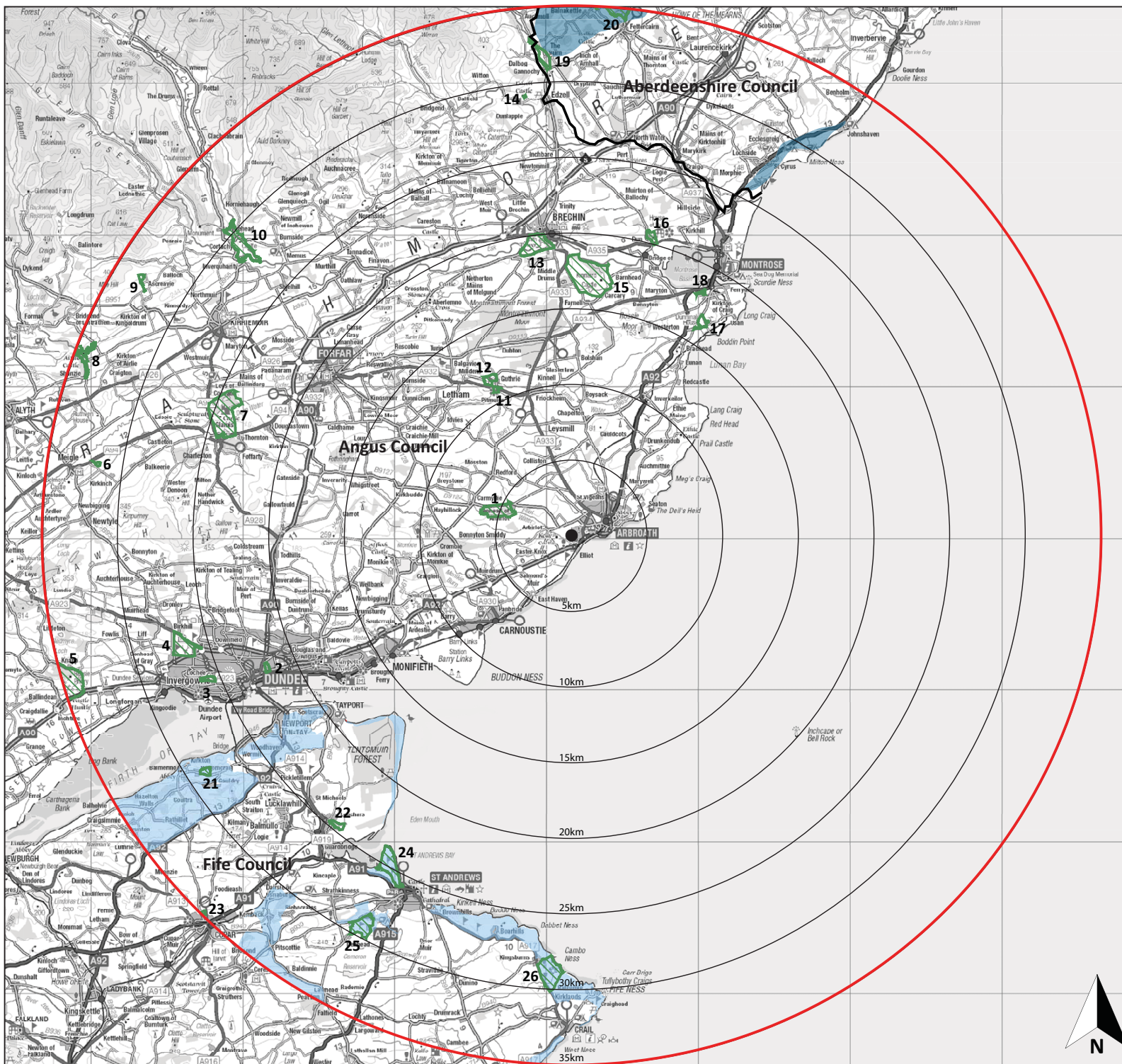
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Document Title: **Landscape Planning Designations Surrounding Bairds Malt**  
Scale: **1:250,000 @ A3**

- Key:
- Proposed Turbine Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
  - Local Authority Boundary
  - Areas of Landscape Significance
  - Special Landscape Areas
  - GDL Area and Identifier

- 1 - The Guynd
- 2 - Baxter Park
- 3 - Balgay Park
- 4 - Camperdown House
- 5 - Rossie Priory
- 6 - Drumkilbo
- 7 - Glamis Castle
- 8 - Airlie Castle
- 9 - Ascreavie
- 10 - Cortachy Castle
- 11 - House of Pitmuies
- 12 - Guthrie Castle
- 13 - Brechin Castle
- 14 - Edzell Castle
- 15 - Kinnaird Castle
- 16 - House of Dun
- 17 - Dunninald
- 18 - Craig House
- 19 - The Burn
- 20 - Fasque House
- 21 - Naughton
- 22 - Earlishall
- 23 - Dalgairn
- 24 - St Andrews Links
- 25 - Craigtoun
- 26 - Cambo

Client: **Bairds Malt Single Turbine Ltd**  
Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.4**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



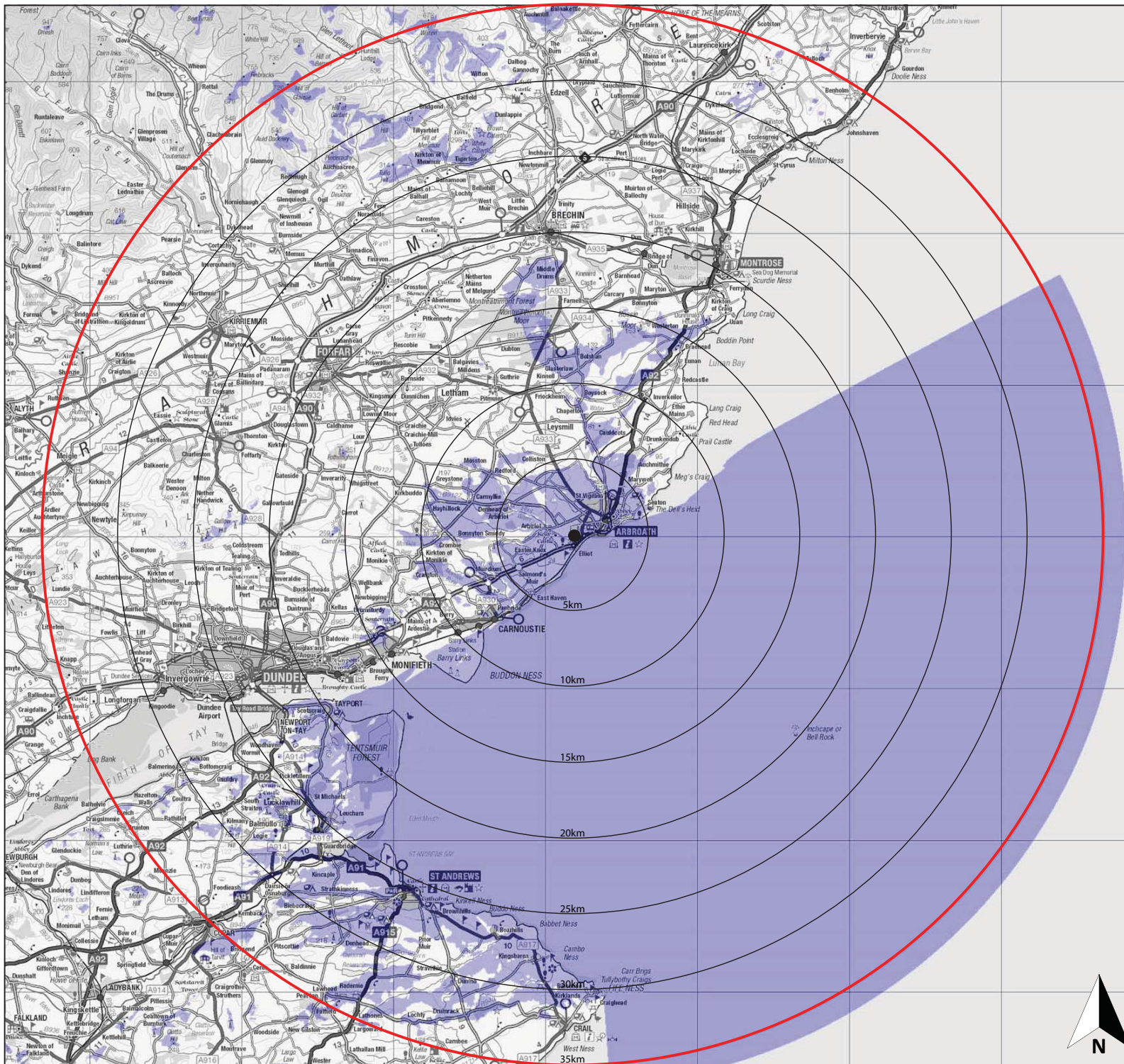
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Scale: **1:250,000 @ A3**

- Key:
- Proposed Turbine Location
  - 5, 10, 15, 20, 25, 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
  - Turbine Hub Theoretically Visible



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Client: **Bairds Malt Single Turbine Ltd**



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Document Number: **C0621-163/Fig 7.5**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



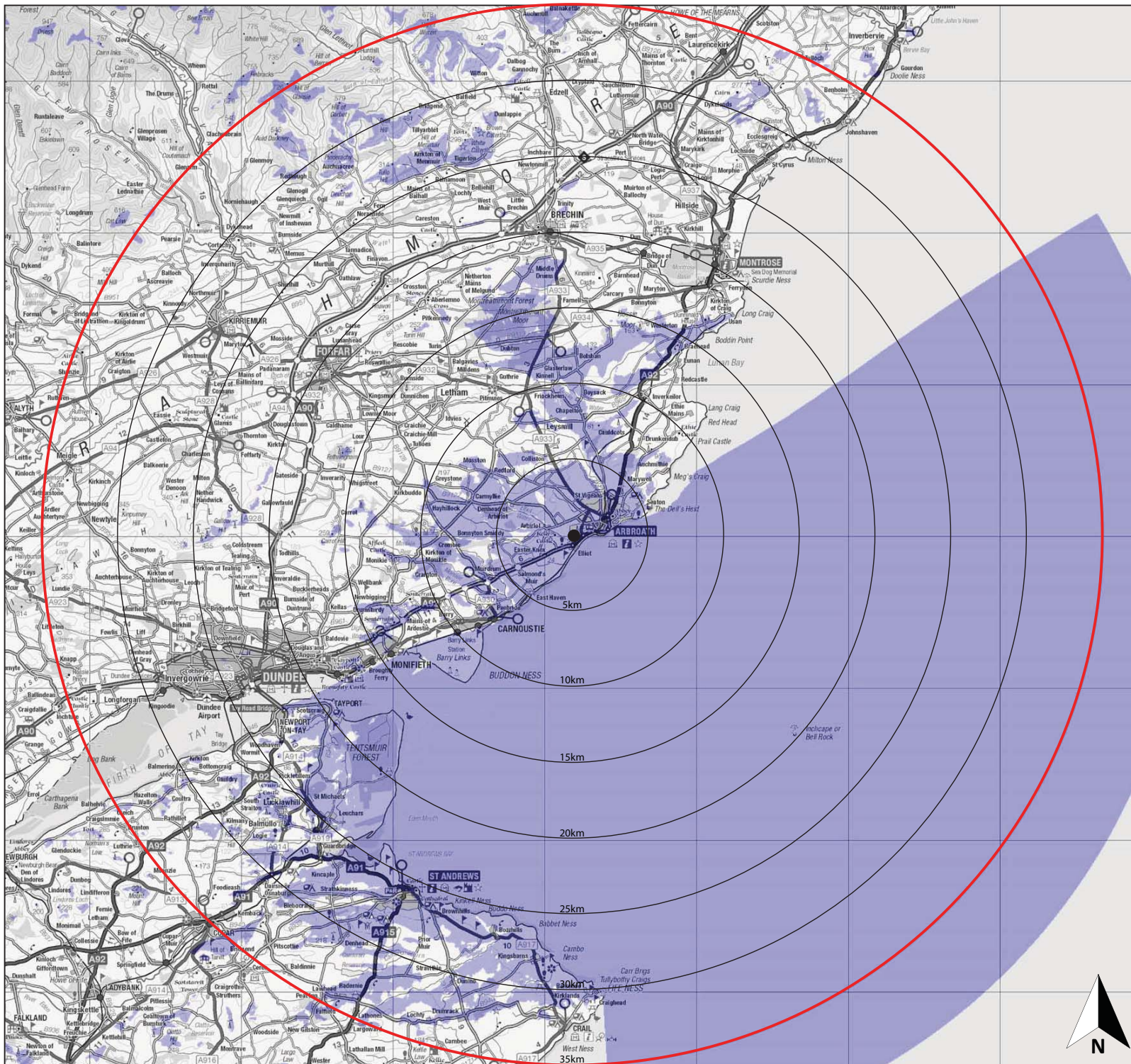
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- Key:
- Proposed Turbine Location
  - 5, 10, 15, 20, 25, 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)

■ Turbine Tip Theoretically Visible



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Client: **Bairds Malt Single Turbine Ltd**

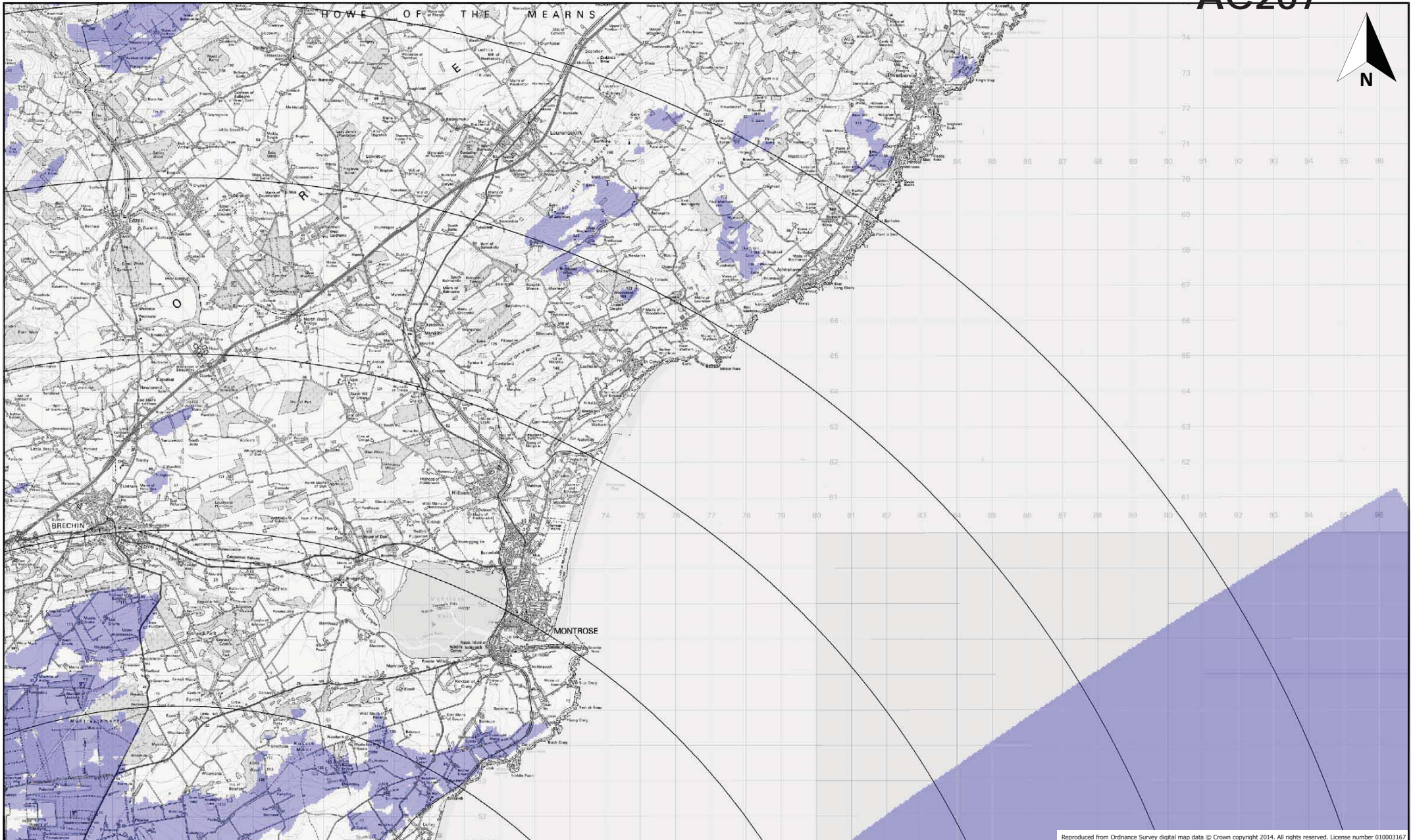


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Document Number: **C0621-163/Fig 7.6**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**







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Project Name: **Bairds Malt Wind Turbine**


Document Title: **Detailed ZTV to 77m Tip Height - North East Zone**

Scale: **1:100,000 @ A3**

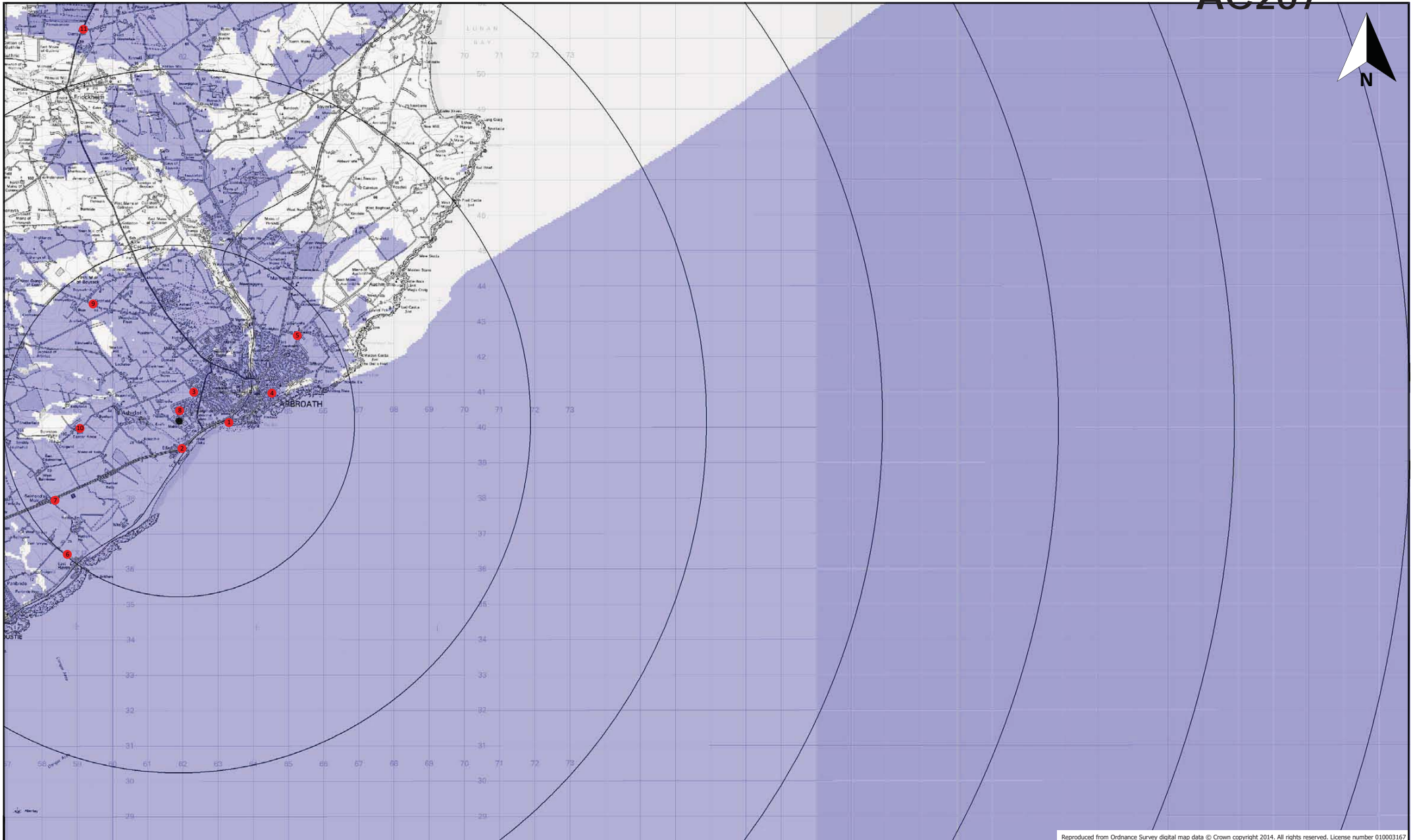
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		16 - White Caterthun																	

Document Number:	<b>CO621-163/Fig 7.7a</b>
Version:	<b>1.0</b>
Author:	<b>SS</b>
Checked by:	<b>RC</b>
Approved By:	<b>GM</b>
Date:	<b>17/12/2014</b>

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Project Name: **Bairds Malt Wind Turbine**


Document Title: **Detailed ZTV to 77m Tip Height - East Zone**

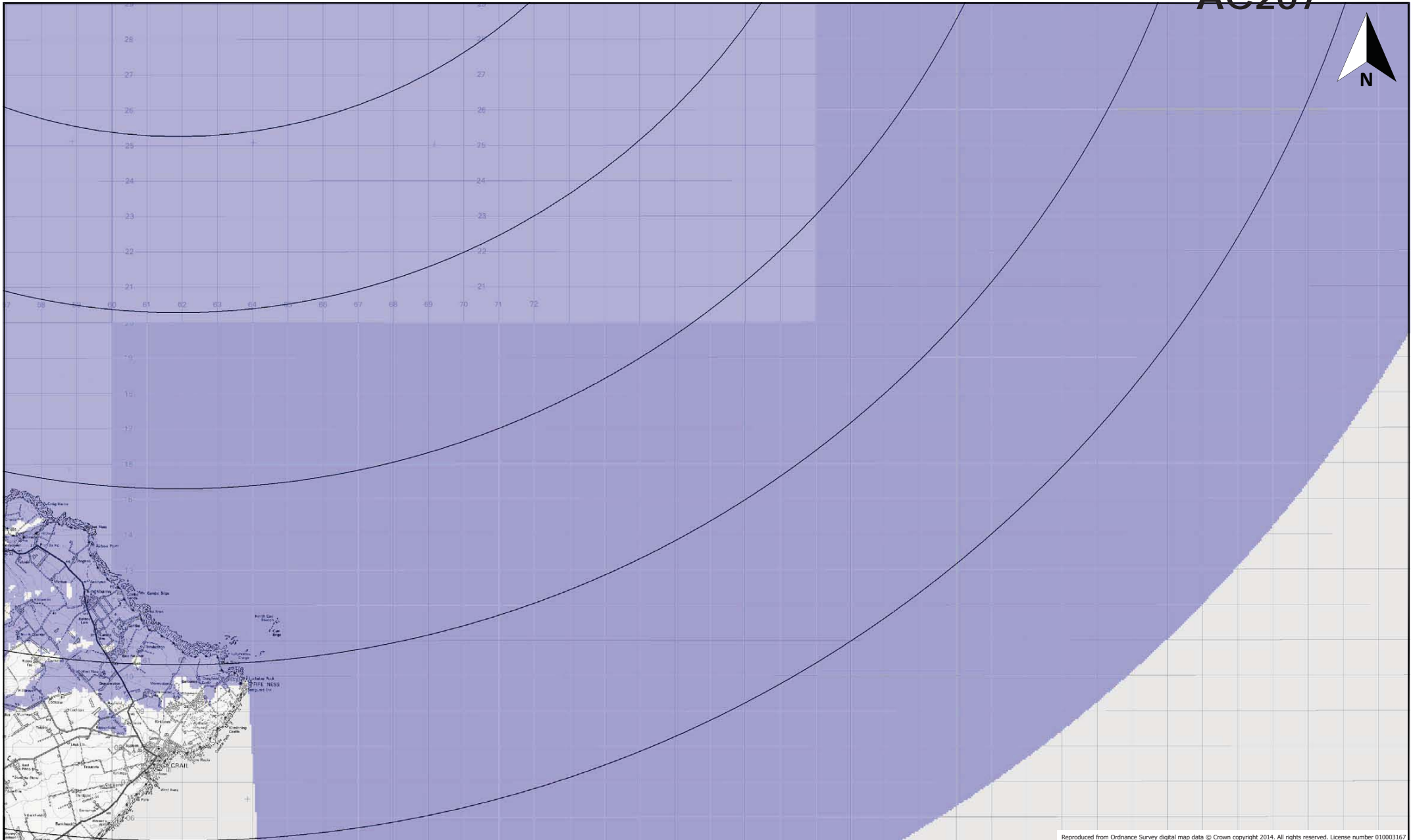
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		16 - White Caterthun																	

Document Number:	<b>CO621-163/Fig 7.7b</b>
Version:	<b>1.0</b>
Author:	<b>SS</b>
Checked by:	<b>RC</b>
Approved By:	<b>GM</b>
Date:	<b>17/12/2014</b>

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Project Name: **Bairds Malt Wind Turbine**


Document Title: **Detailed ZTV to 77m Tip Height - South East Zone**

Scale: **1:100,000 @ A3**

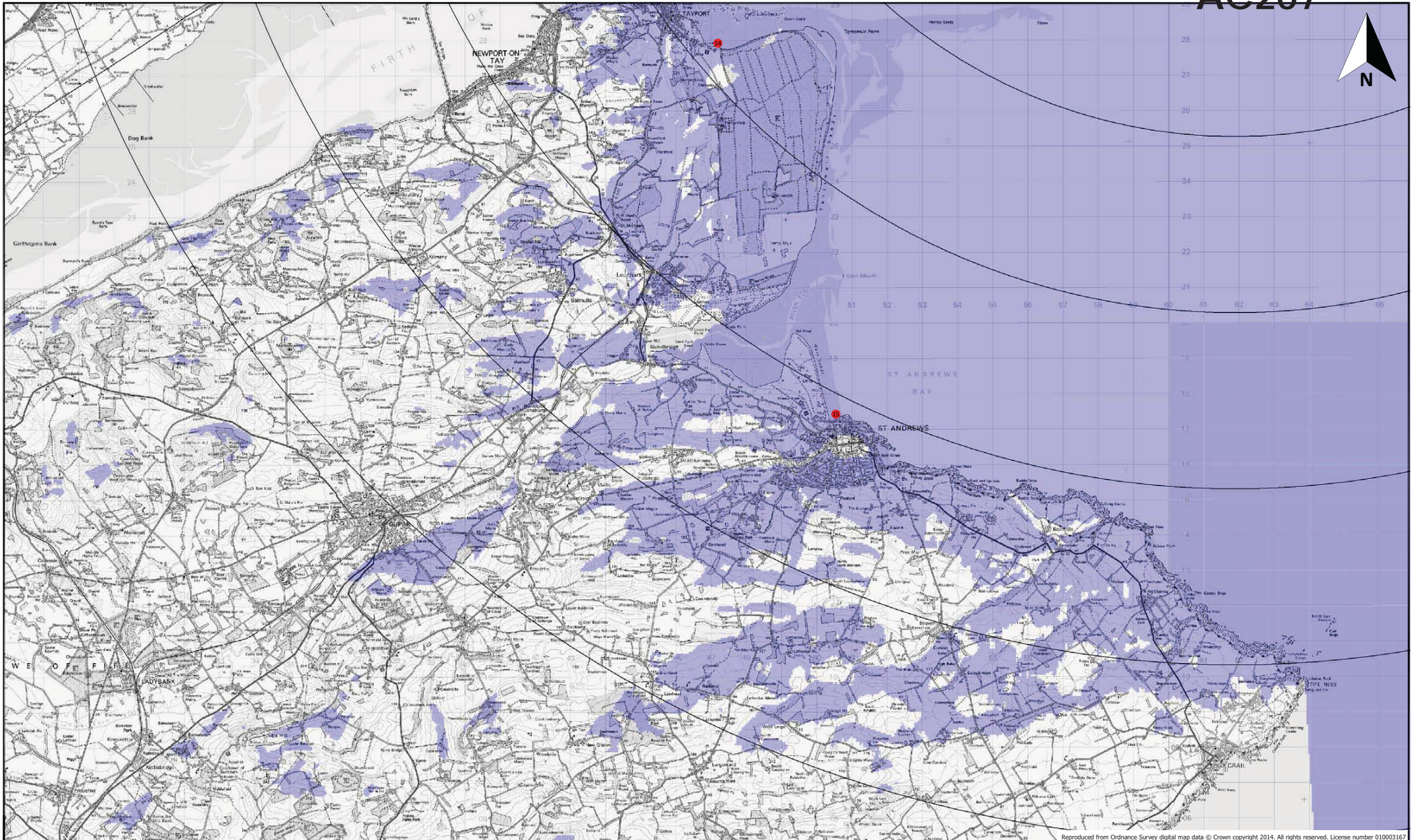
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5 - Bearfauld Road	10 - Braemore	15 - St Andrews																	
		16 - White Caterthun																	

Document Number:	<b>CO621-163/Fig 7.7c</b>
Version:	<b>1.0</b>
Author:	<b>SS</b>
Checked by:	<b>RC</b>
Approved By:	<b>GM</b>
Date:	<b>17/12/2014</b>

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Project Name: **Bairds Malt Wind Turbine**

Document Title: **Detailed ZTV to 77m Tip Height - South West Zone**

Scale: **1:100,000 @ A3**

Key:	● Proposed Turbine Location	① Viewpoint Locator & Identifier
	■ Zone of Theoretical Visibility	<u>Viewpoint Name:</u>
	— 5, 10, 15, 20, 25, 30 & 35km Radii from Proposed Wind Turbine	1 - Queen's Drive, Arbroath 2 - Elliot Bridge 3 - Arbrinot Road West 4 - Boulzie Hill 5 - Bearfauld Road
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		11 - A933 Montreathtmont 12 - Dodd Hill 13 - Turin Hill 14 - Tentsmuir Recreational Area 15 - St Andrews 16 - White Caterthun

Document Number: **CO621-163/Fig 7.7d**

Version: **1.0**

Author: **SS**

Checked by: **RC**

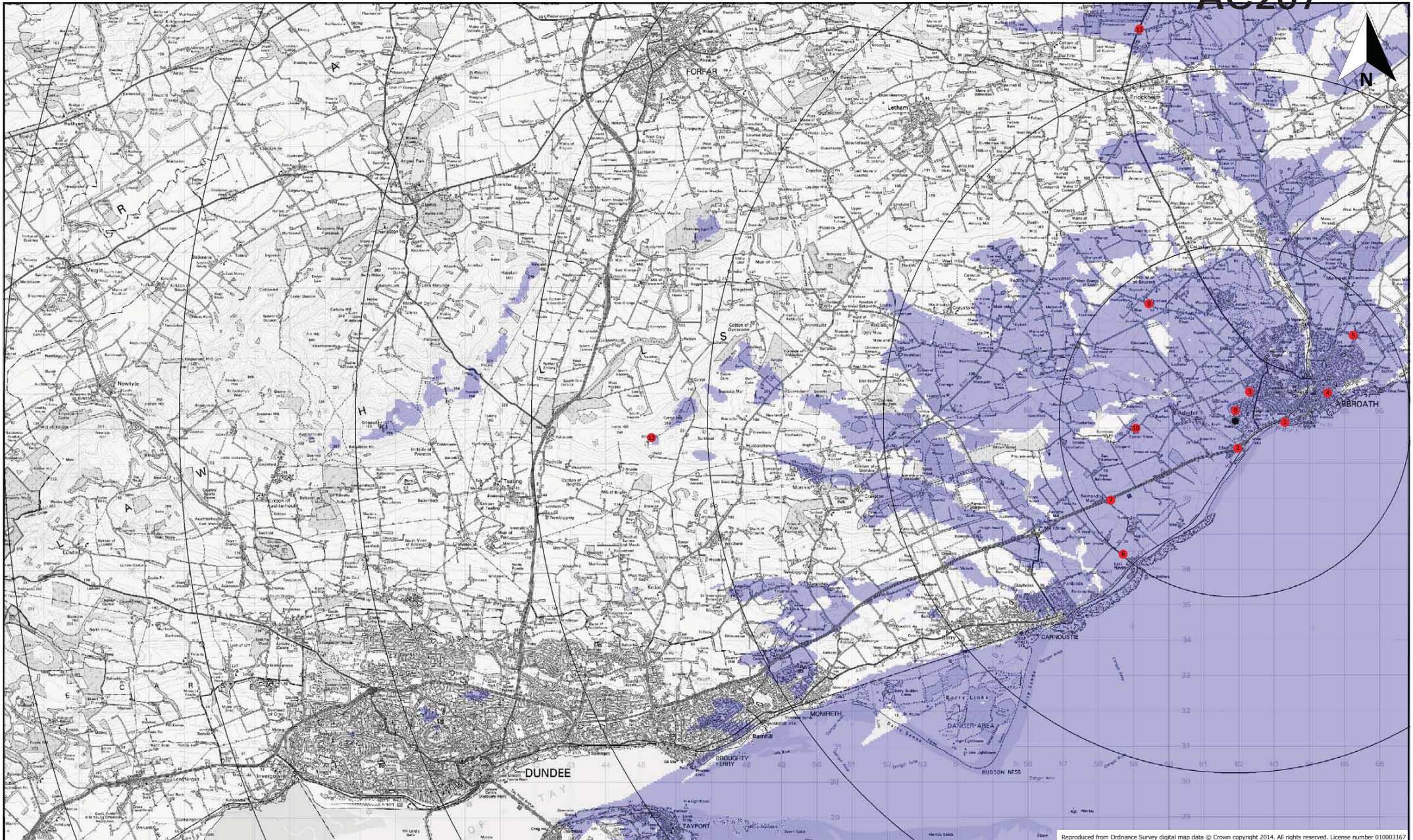
Approved By: **GM**

Date: **17/12/2014**

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Project Name: **Bairds Malt Wind Turbine**

Document Title: **Detailed ZTV to 77m Tip Height - West Zone**

Scale: **1:100,000 @ A3**

<p>Key:</p> <ul style="list-style-type: none"> <li>● Proposed Turbine Location</li> <li>■ Zone of Theoretical Visibility</li> <li>— 5, 10, 15, 20, 25, 30 &amp; 35km Radii from Proposed Wind Turbine</li> </ul>	<p>● Viewpoint Locator &amp; Identifier</p> <p><u>Viewpoint Name:</u></p> <table border="0"> <tr> <td>1 - Queen's Drive, Arbroath</td> <td>6 - East Haven</td> <td>11 - A933 Montreathmont</td> </tr> <tr> <td>2 - Elliot Bridge</td> <td>7 - A92, Salmond's Muir</td> <td>12 - Dodd Hill</td> </tr> <tr> <td>3 - Arbrinot Road West</td> <td>8 - Patrick Allan Fraser Street</td> <td>13 - Turin Hill</td> </tr> <tr> <td>4 - Boulzie Hill</td> <td>9 - Firthfield</td> <td>14 - Tentsmuir Recreational Area</td> </tr> <tr> <td>5 - Bearfauld Road</td> <td>10 - Braemore</td> <td>15 - St Andrews</td> </tr> <tr> <td></td> <td></td> <td>16 - White Caterthun</td> </tr> </table>	1 - Queen's Drive, Arbroath	6 - East Haven	11 - A933 Montreathmont	2 - Elliot Bridge	7 - A92, Salmond's Muir	12 - Dodd Hill	3 - Arbrinot Road West	8 - Patrick Allan Fraser Street	13 - Turin Hill	4 - Boulzie Hill	9 - Firthfield	14 - Tentsmuir Recreational Area	5 - Bearfauld Road	10 - Braemore	15 - St Andrews			16 - White Caterthun
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		16 - White Caterthun																	

Document Number:	<b>CO621-163/Fig 7.7e</b>
Version:	<b>1.0</b>
Author:	<b>SS</b>
Checked by:	<b>RC</b>
Approved By:	<b>GM</b>
Date:	<b>17/12/2014</b>

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Project Name: **Bairds Malt Wind Turbine**

Document Title: **Detailed ZTV to 77m Tip Height - North West Zone**

Scale: **1:100,000 @ A3**

●	Proposed Turbine Location	●	Viewpoint Locator & Identifier
■	Zone of Theoretical Visibility	<u>Viewpoint Name:</u>	
—	5, 10, 15, 20, 25, 30 & 35km Radii from Proposed Wind Turbine	1 - Queen's Drive, Arbroath	6 - East Haven
		2 - Elliot Bridge	7 - A92, Salmond's Muir
		3 - Arbrinot Road West	8 - Patrick Allan Fraser Street
		4 - Boulton Hill	9 - Firthfield
		5 - Bearfauld Road	10 - Braemore
			11 - A933 Montreatmont
			12 - Dodd Hill
			13 - Turin Hill
			14 - Tentsmuir Recreational Area
			15 - St Andrews
			16 - White Caterthun

Document Number: **CO621-163/Fig 7.7f**

Version: **1.0**

Author: **SS**

Checked by: **RC**

Approved By: **GM**

Date: **17/12/2014**

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**Key:**

● Proposed Turbine Location

□ 10, 20, 30, 40 & 50km Radii from Proposed Wind Turbine

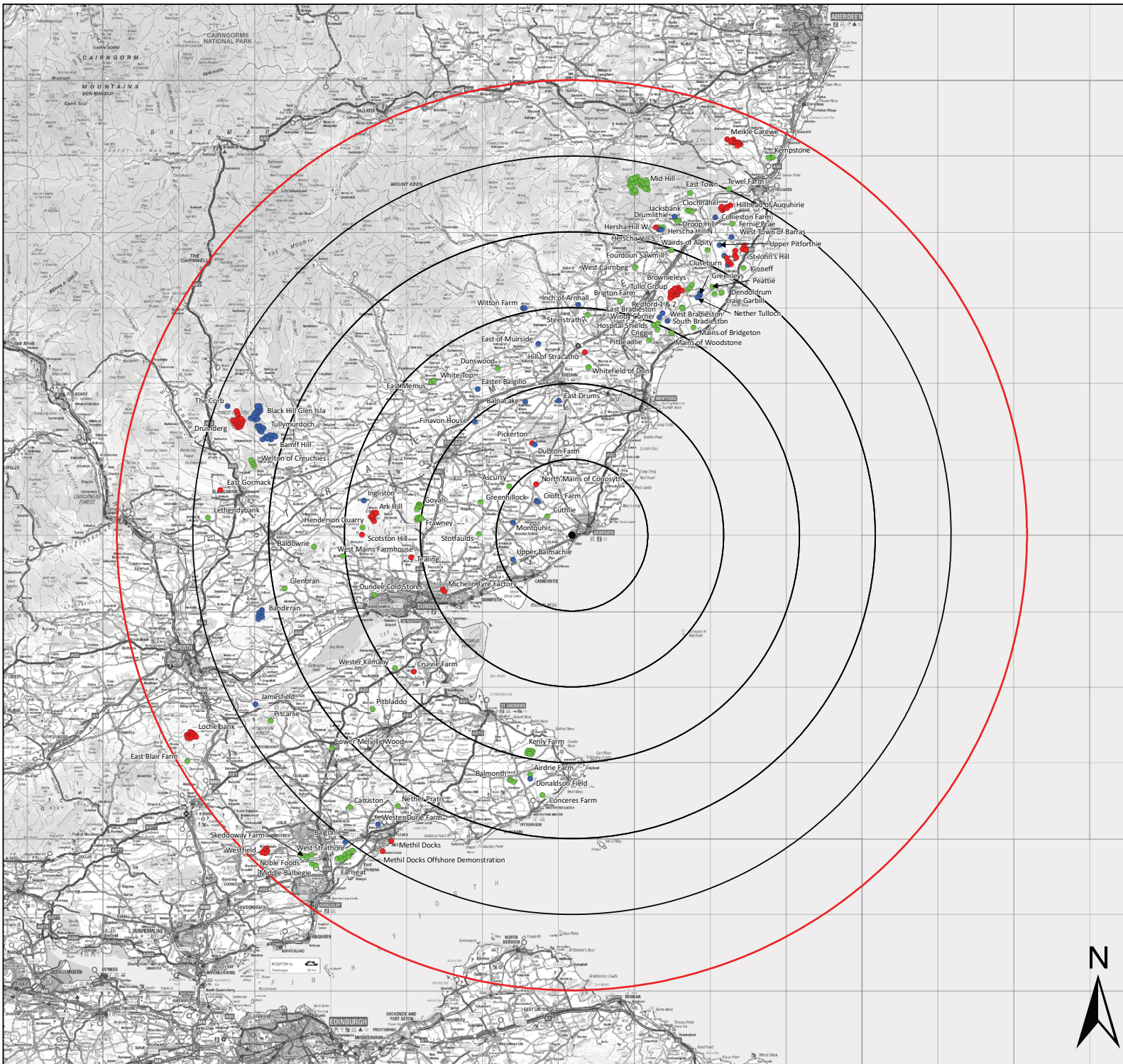
□ Cumulative Study Area (60km)

**Status**

● Operational

● Consented

● In Planning



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.8**

Version: **1.0**

Author: **PL**

Checked by: **RC**

Approved by: **GM**

Date: **11/12/2014**

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**Key:**

● Proposed Turbine Location

□ 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine

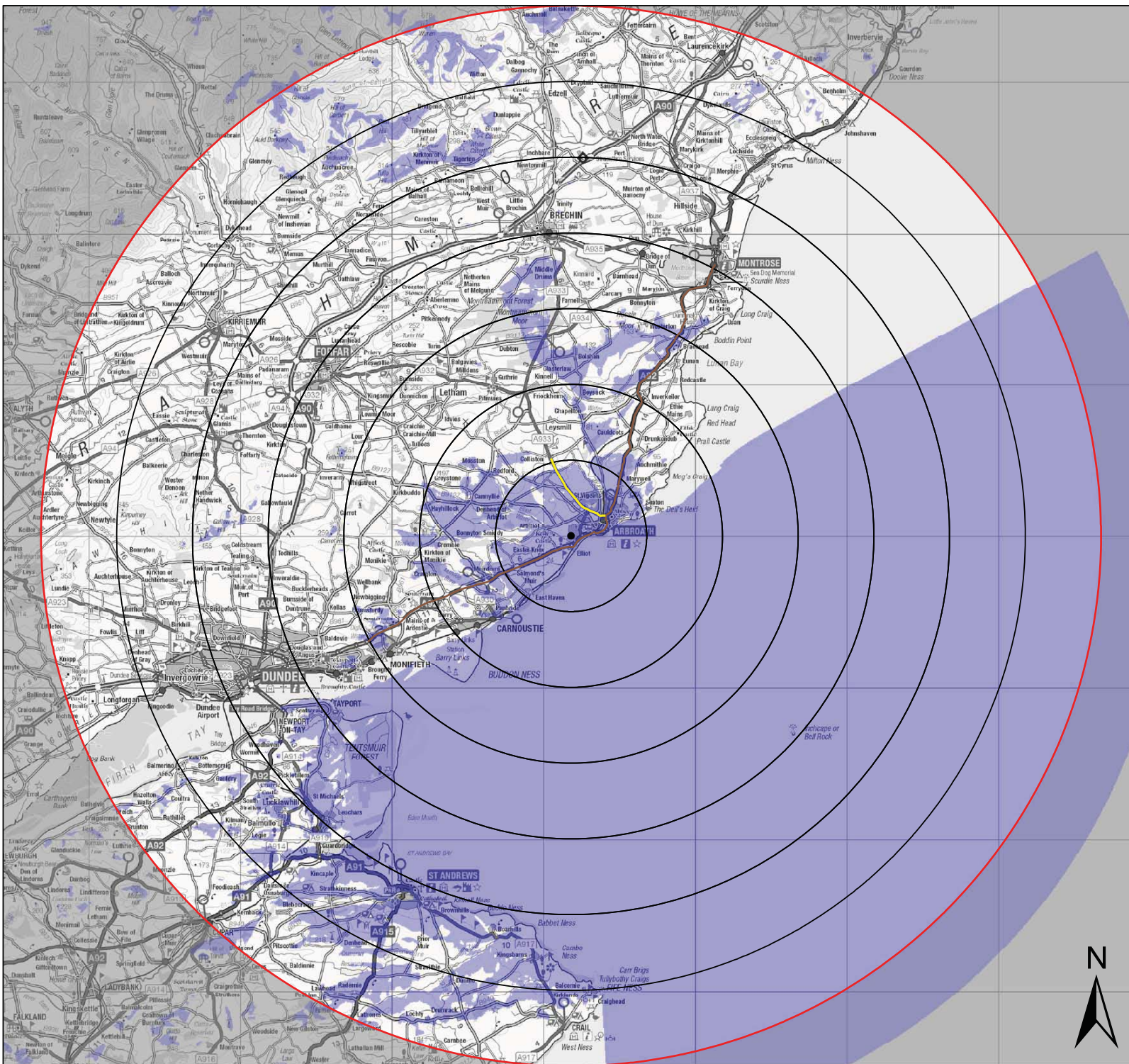
□ Landscape and Visual Study Area (35km)

**ZTV Key**

■ 1 Turbine Tip Theoretically Visible

— A933, from Arbroath to Colliston

— A92, from Monifieth to Montrose



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.9**

Version: **1.0**

Author: **PL**

Checked by: **RC**

Approved by: **GM**

Date: **18/12/2014**

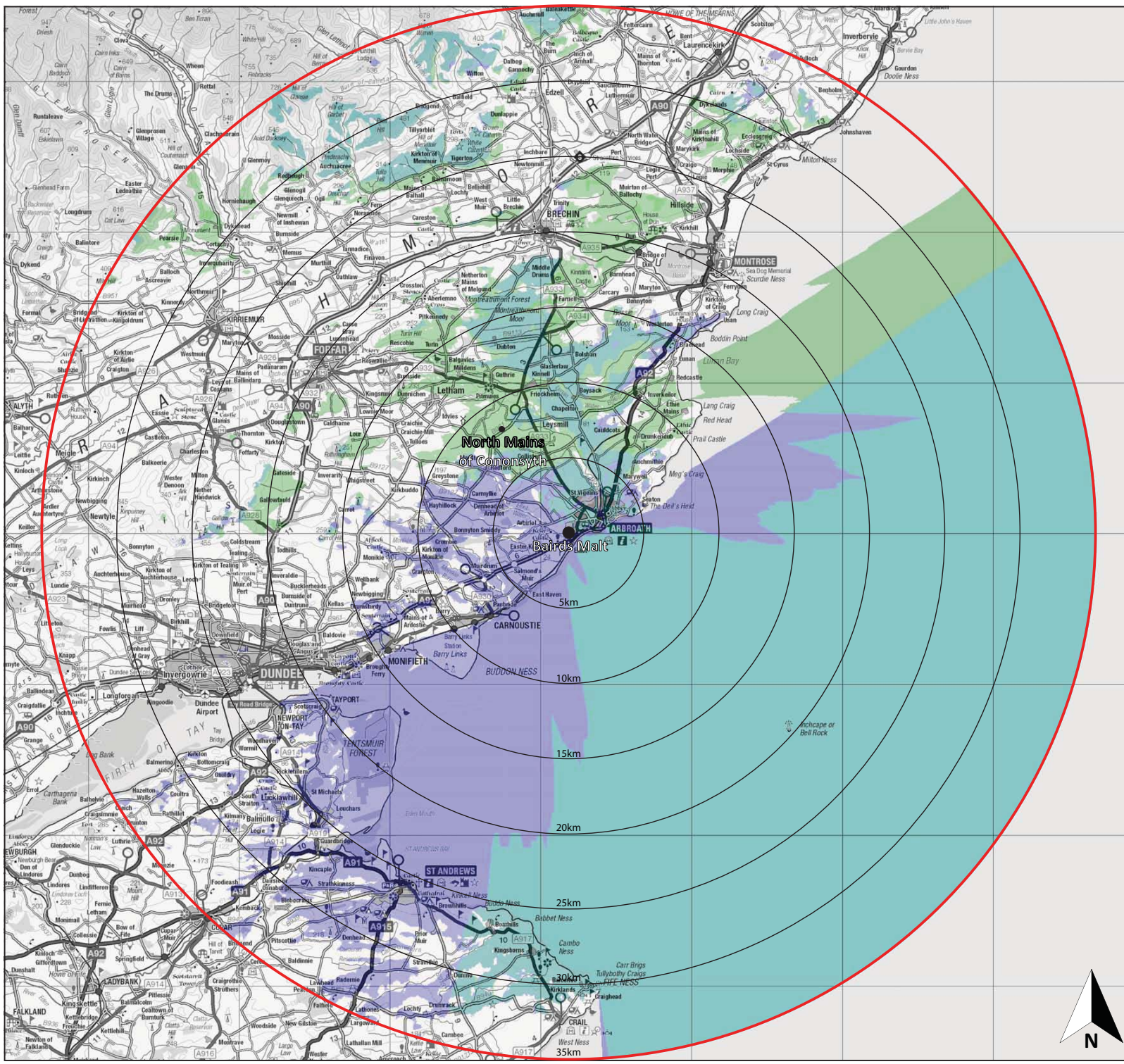
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Projects Name: **Bairds Malt Wind Turbine**  
Document Title: **Cumulative ZTV to Tip Height - North Mains of Cononsyth (Operational)**  
Scale: **1:250,000 @ A3**


- Key:
- Proposed Turbine Location
  - Other Project Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
  - Bairds Malt Visible
  - North Mains of Cononsyth Visible
  - Bairds Malt & North Mains of Cononsyth Visible



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Client: **Bairds Malt Single Turbine Ltd**  


Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.10a**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**  
  
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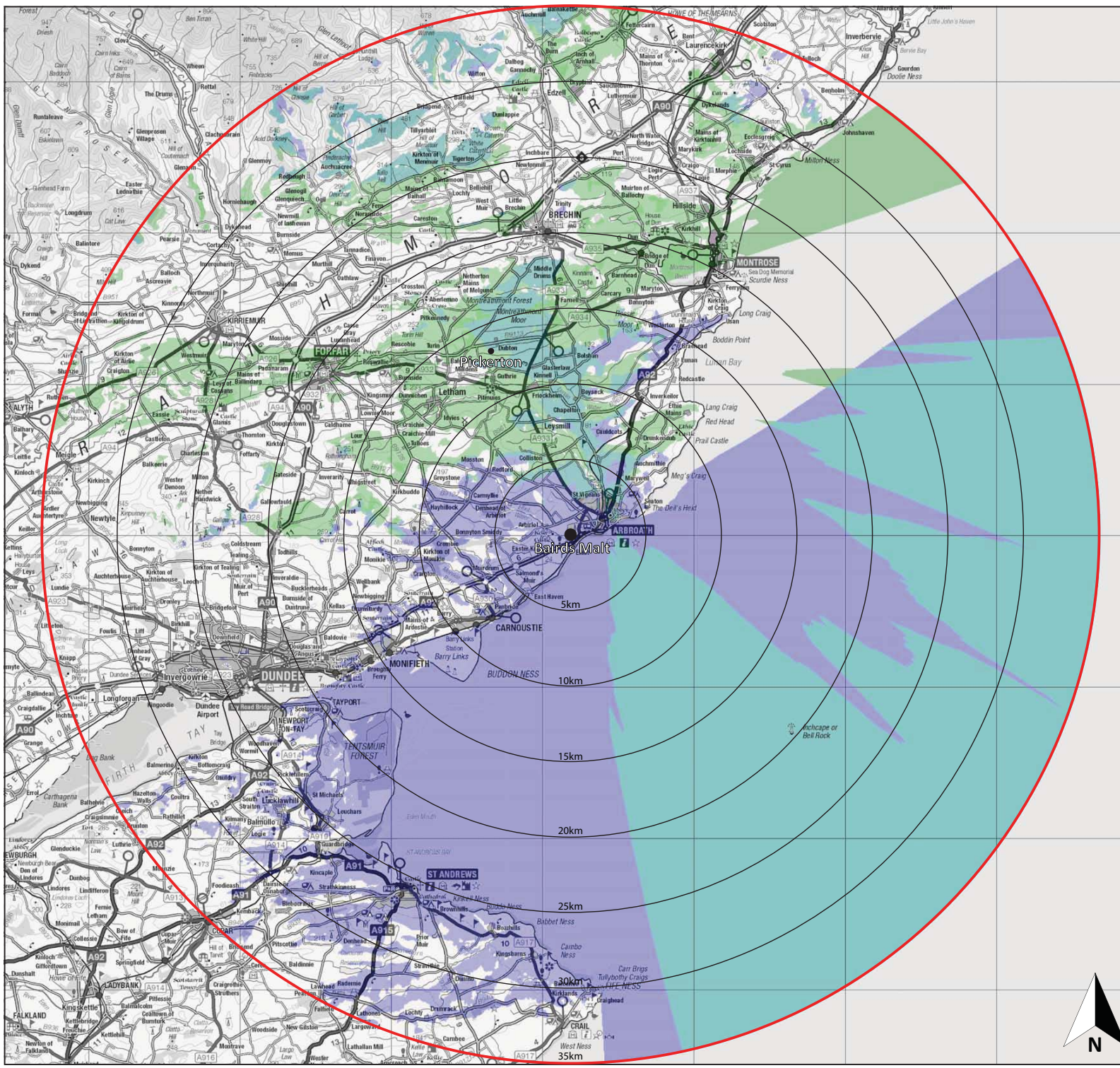
Projects Name: **Bairds Malt Wind Turbine**

Document Title: **Cumulative ZTV to Tip Height - Pickerton (Operational)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Pickerton Visible
- Bairds Malt & Pickerton Visible



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.10b**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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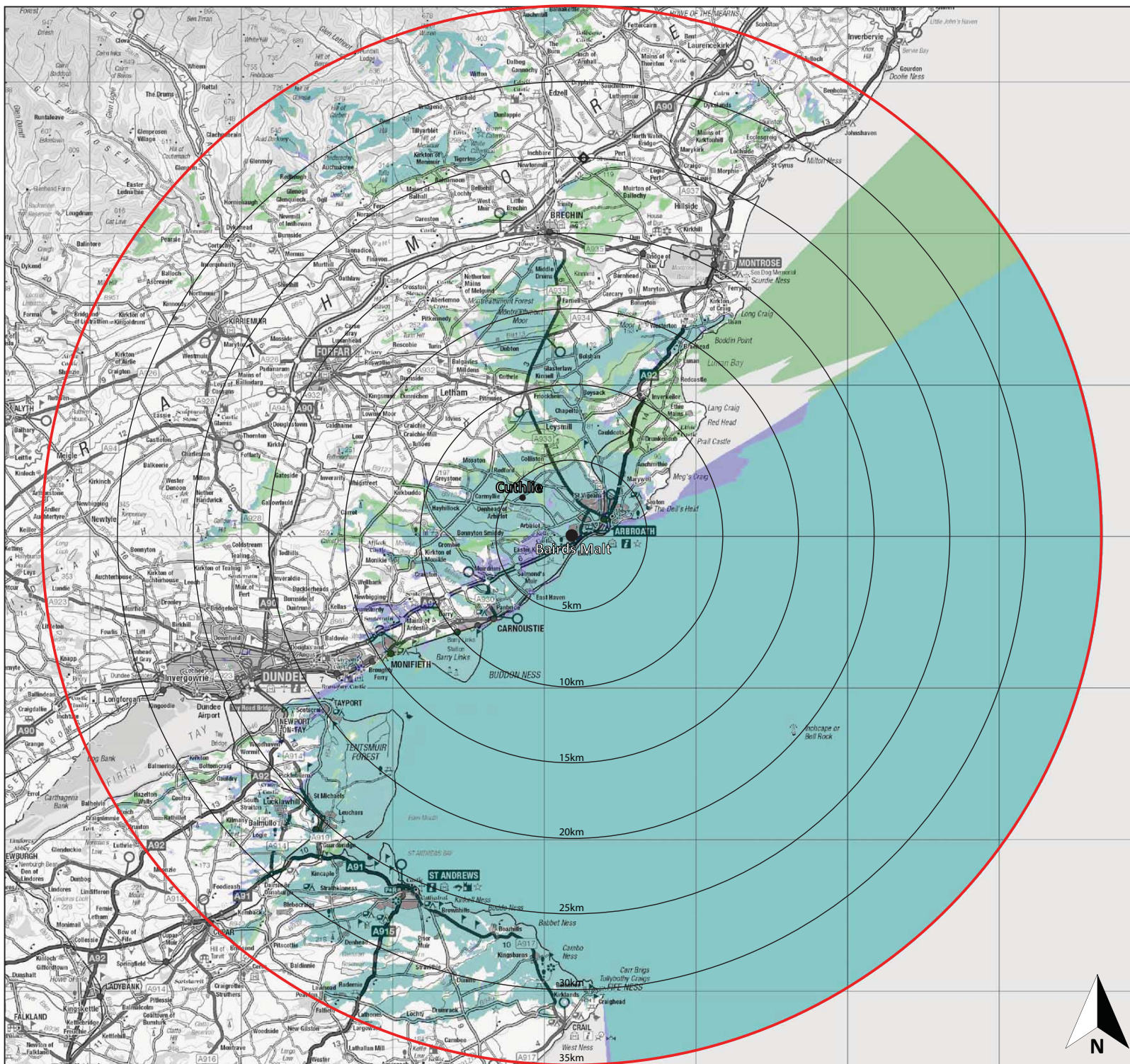
Projects Name: **Bairds Malt Wind Turbine**

Document Title: **Cumulative ZTV to Tip Height - Cuthlie (Consented)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Cuthlie Visible
- Bairds Malt & Cuthlie Visible



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

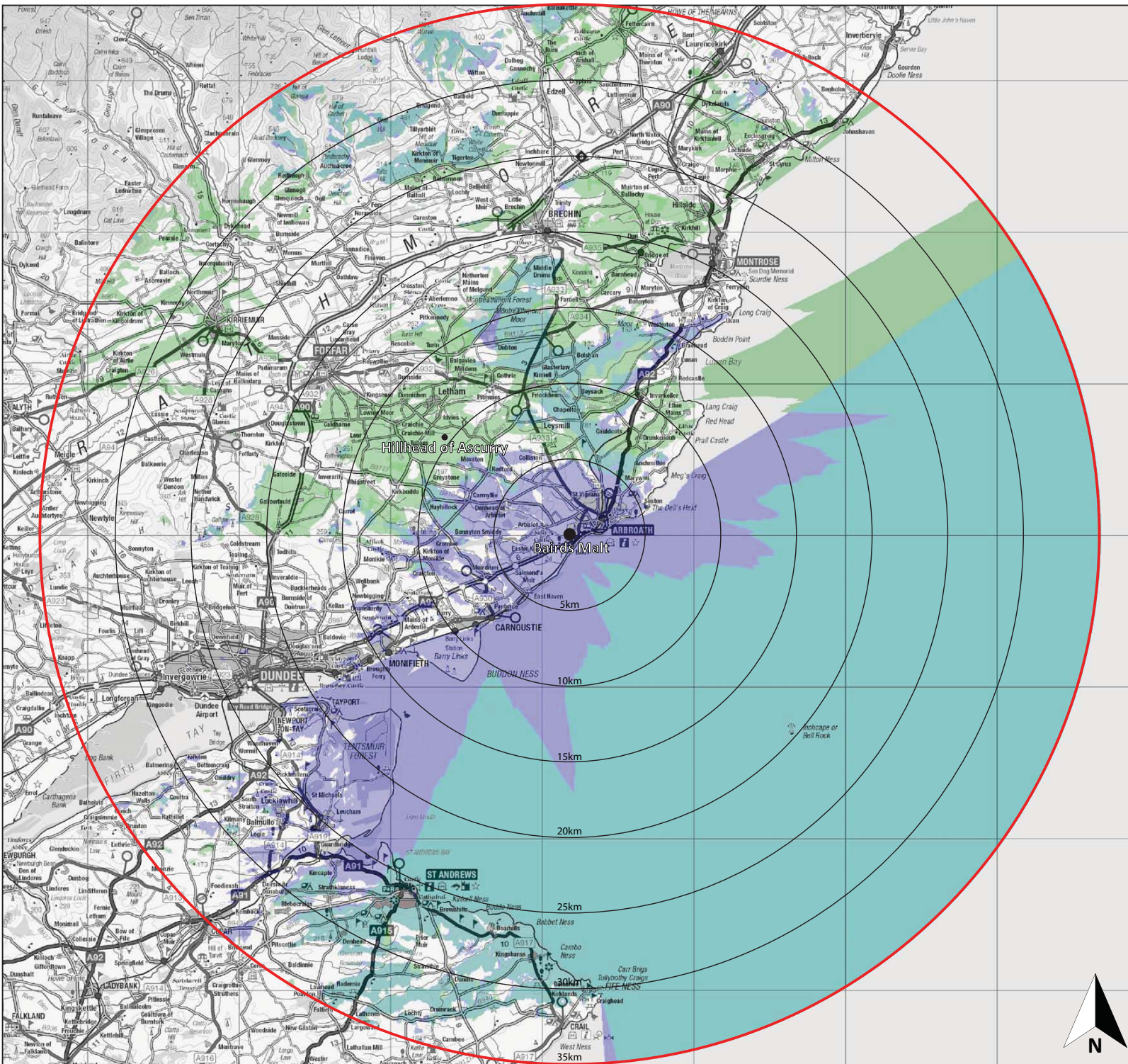
Document Number: **C0621-163/Fig 7.11a**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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Projects Name: **Bairds Malt Wind Turbine**

**AC207**


Document Title: **Cumulative ZTV to Tip Height - Hillhead of Ascurry (Consented)**

Scale: **1:250,000 @ A3**

- Key:
- Proposed Turbine Location
  - Other Project Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
- 
- Bairds Malt Visible
  - Hillhead of Ascurry Visible
  - Bairds Malt & Hillhead of Ascurry Visible

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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.11b**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**

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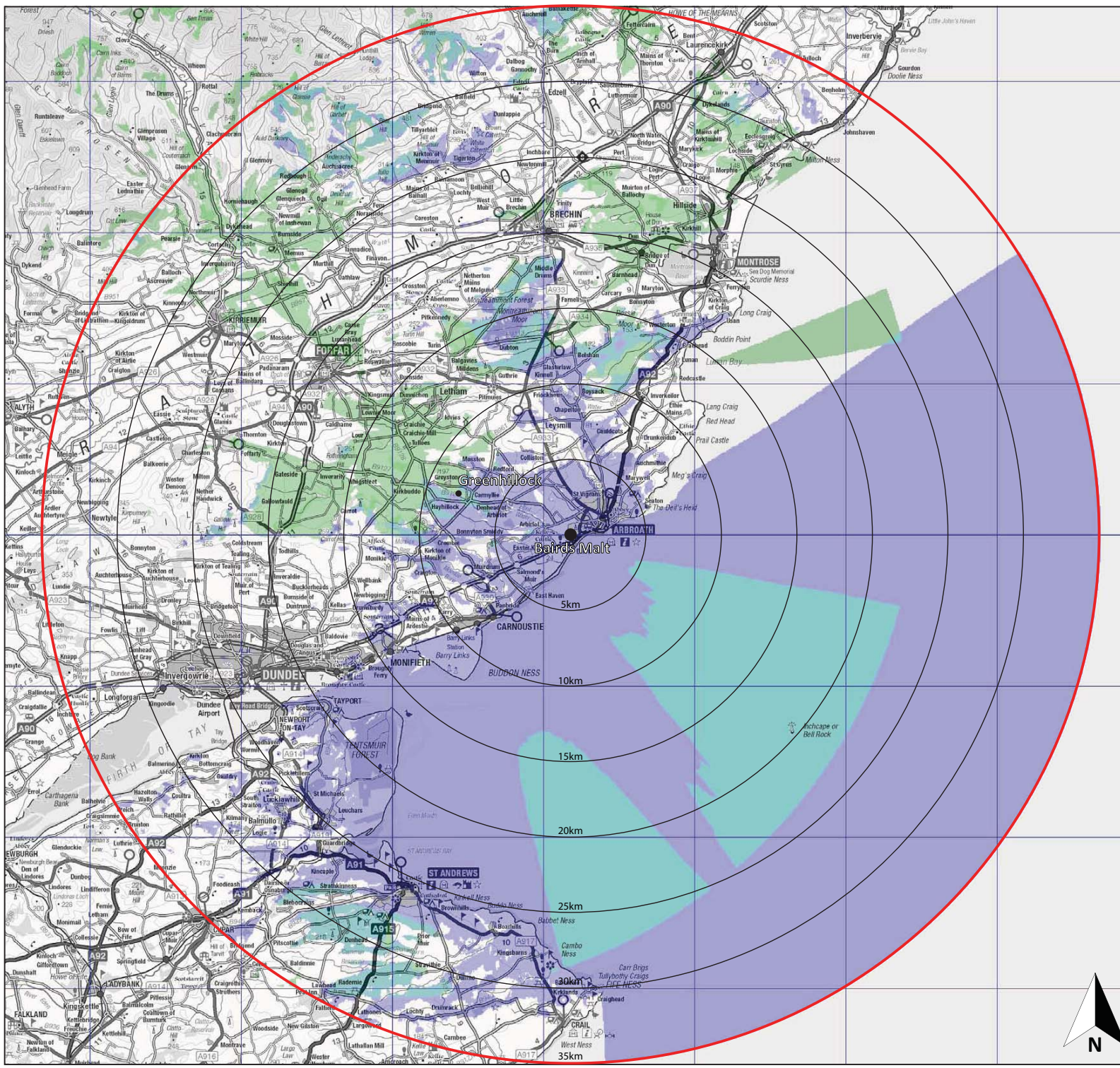
Projects Name: **Bairds Malt Single Wind Turbine**

Document Title: **Cumulative ZTV to Tip Height - Greenhillock (Consented)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Greenhillock Visible
- Bairds Malt & Greenhillock Visible



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.11c**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**

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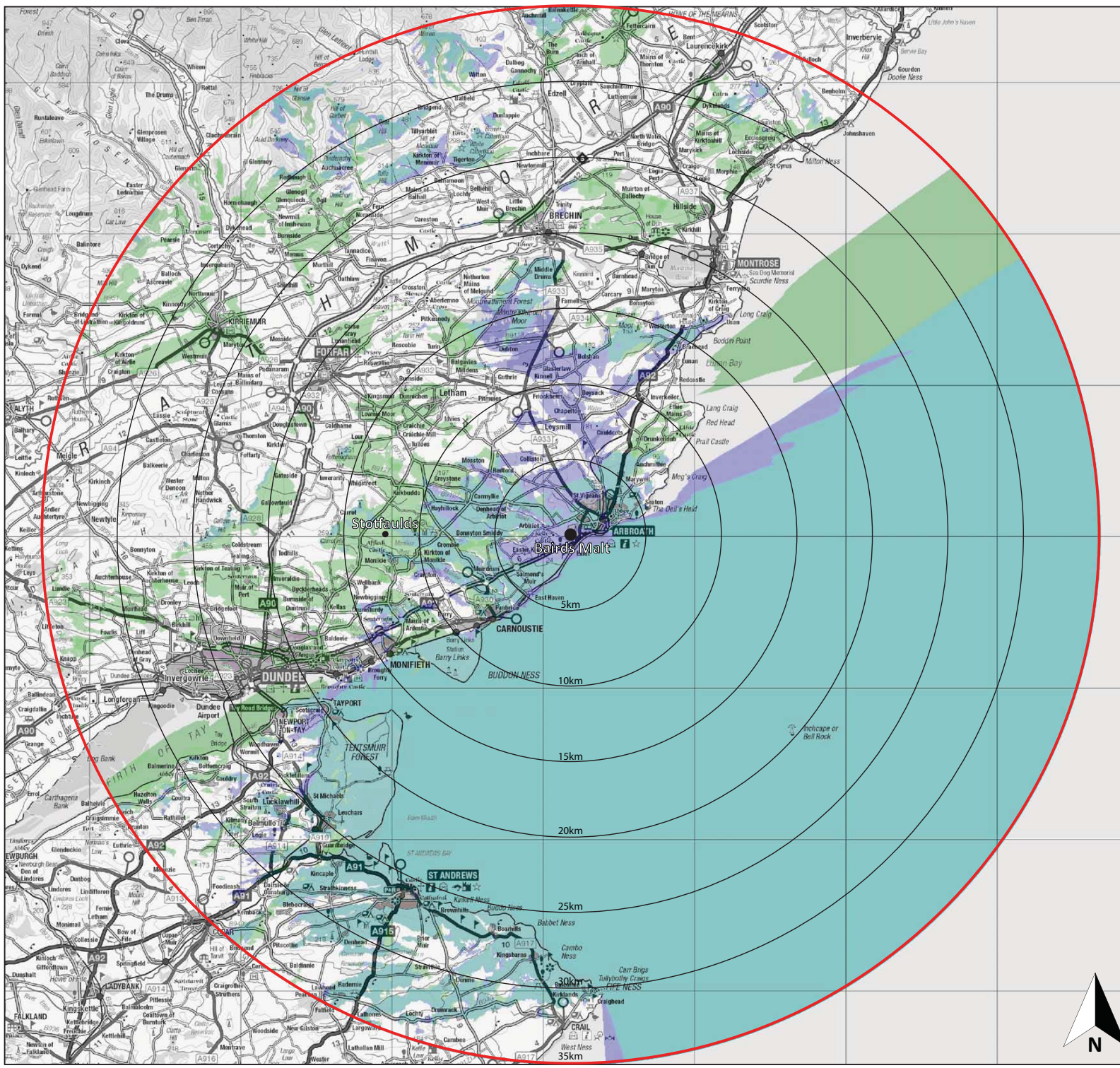
Projects Name: **Bairds Malt Wind Turbine**

Document Title: **Cumulative ZTV to Tip Height - Stotfaulds (Consented)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Stotfaulds Visible
- Bairds Malt & Stotfaulds Visible



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.11d**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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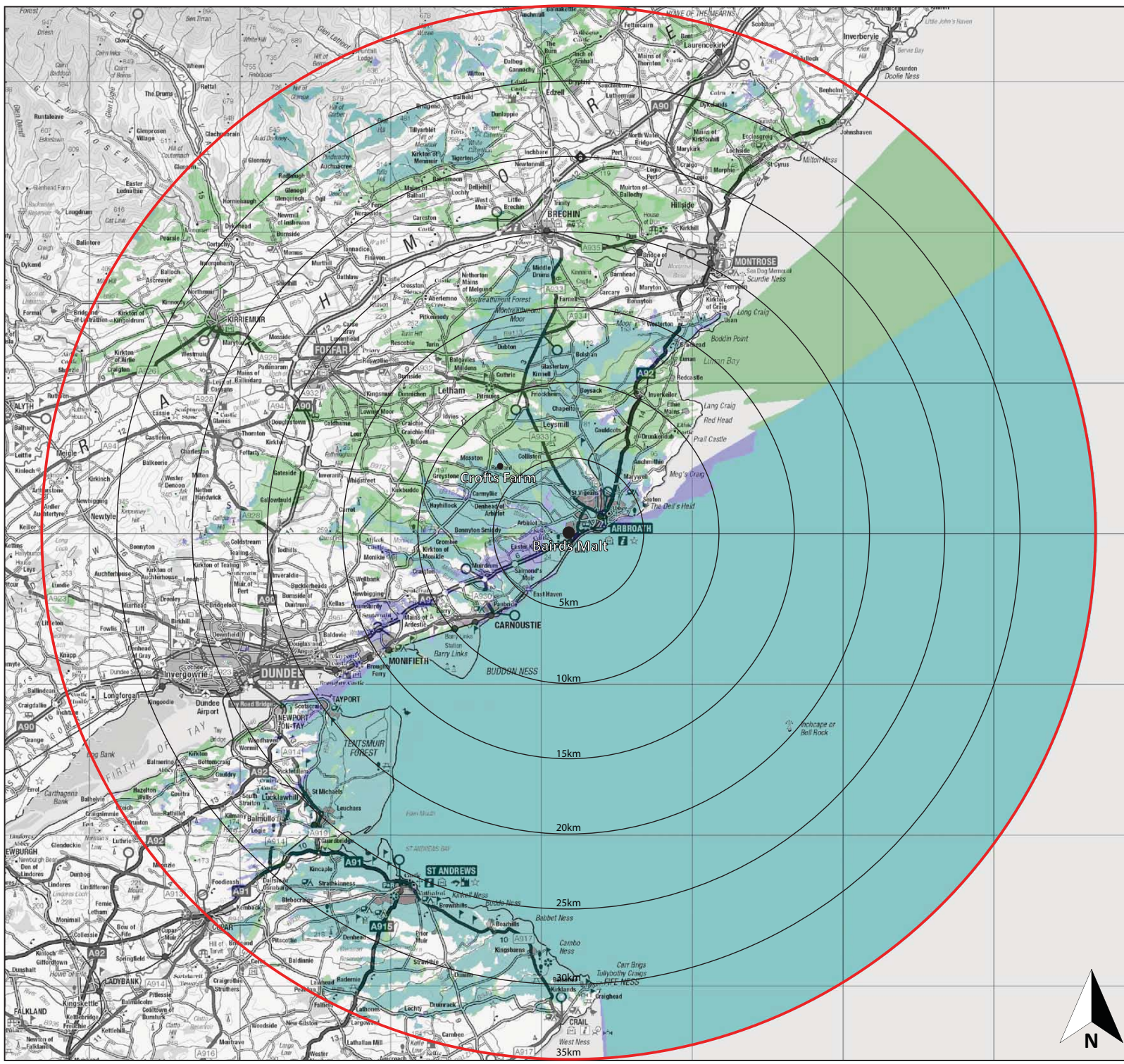
Projects Name: **Bairds Malt Single Wind Turbine**

Document Title: **Cumulative ZTV to Tip Height - Crofts Farm (Planning)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Crofts Farm Visible
- Bairds Malt & Crofts Farm Visible



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Client: **Bairds Malt Single Turbine Ltd**



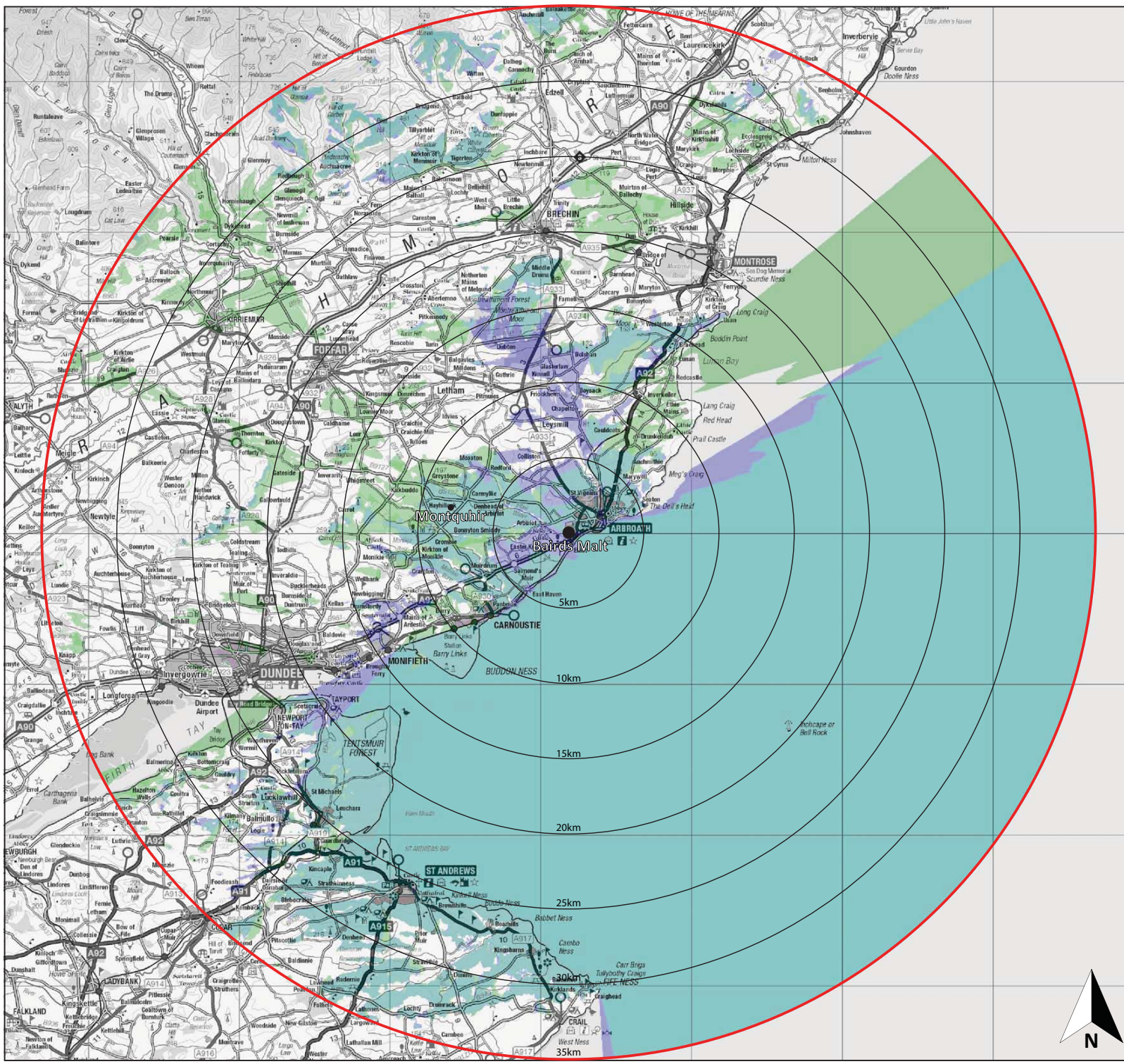
Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.12a**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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**Projects Name:** Bairsds Malt Wind Turbine **AC207**  
**Document Title:** Cumulative ZTV to Tip Height - Montquhir (Planning)  
**Scale:** 1:250,000 @ A3

- Key:**
- Proposed Turbine Location
  - Other Project Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
- 
- Bairsds Malt Visible
  - Montquhir Visible
  - Bairsds Malt & Montquhir Visible

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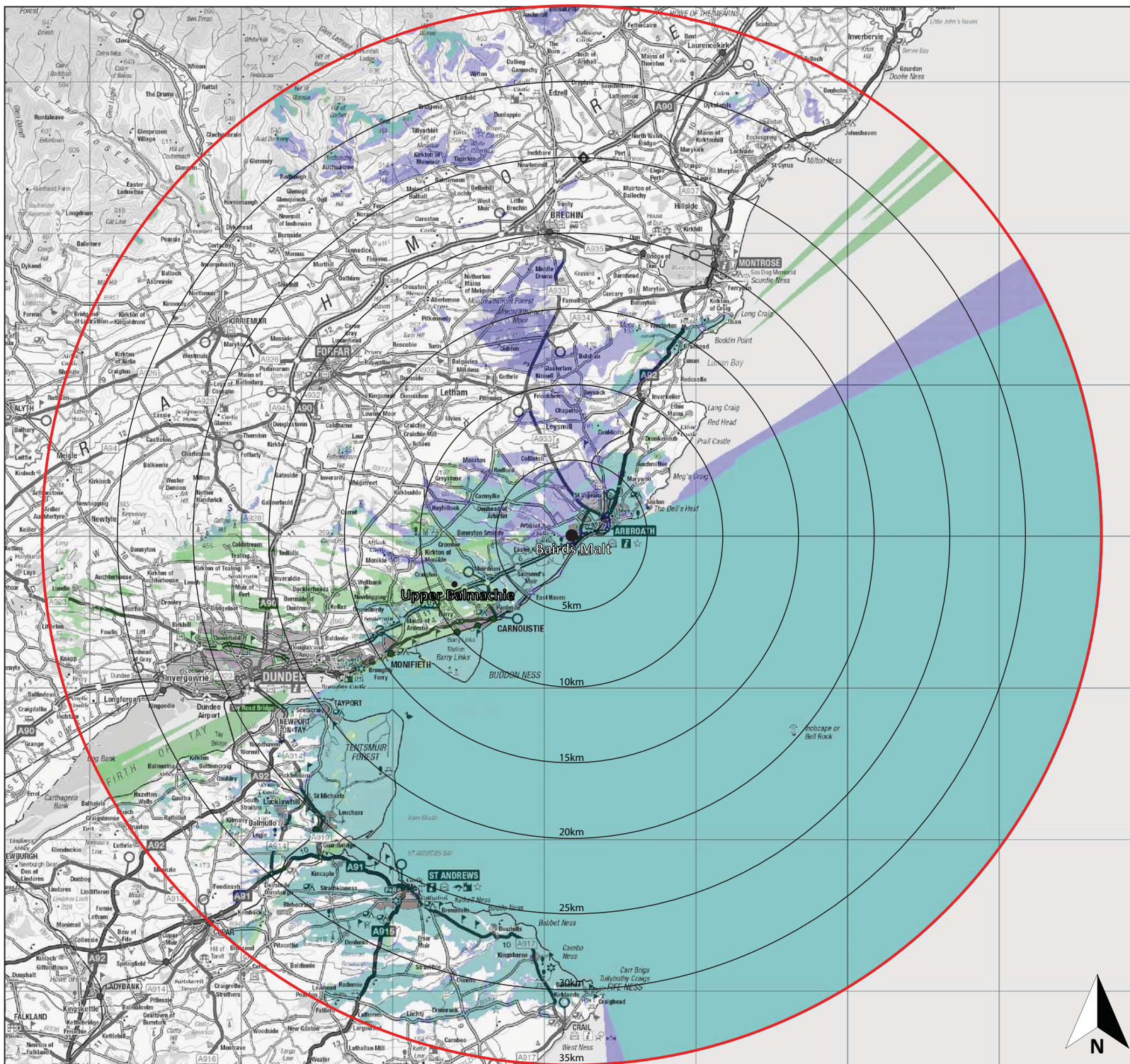
**Client:** Bairsds Malt Single Turbine Ltd 

**Drawing by:** Green Cat Renewables Ltd 

**Document Number:** C0621-163/Fig 7.12b  
**Version:** 1.0  
**Author:** SS  
**Checked by:** RC  
**Approved By:** GM  
**Date:** 17/12/2014  
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Projects Name: **Bairds Malt Wind Turbine**


Document Title: **Cumulative ZTV to Tip Height - Upper Balmachie (Planning)**

Scale: **1:25,000 @ A3**

- Key:
- Proposed Turbine Location
  - Other Project Location
  - 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
  - Landscape and Visual Study Area (35km)
- Bairds Malt Visible
  - Upper Balmachie Visible
  - Bairds Malt & Upper Balmachie Visible

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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

Document Number: **C0621-163/Fig 7.12c**

Version: **1.0**


Author: **SS**

Checked by: **RC**

Approved By: **GM**

Date: **17/12/2014**

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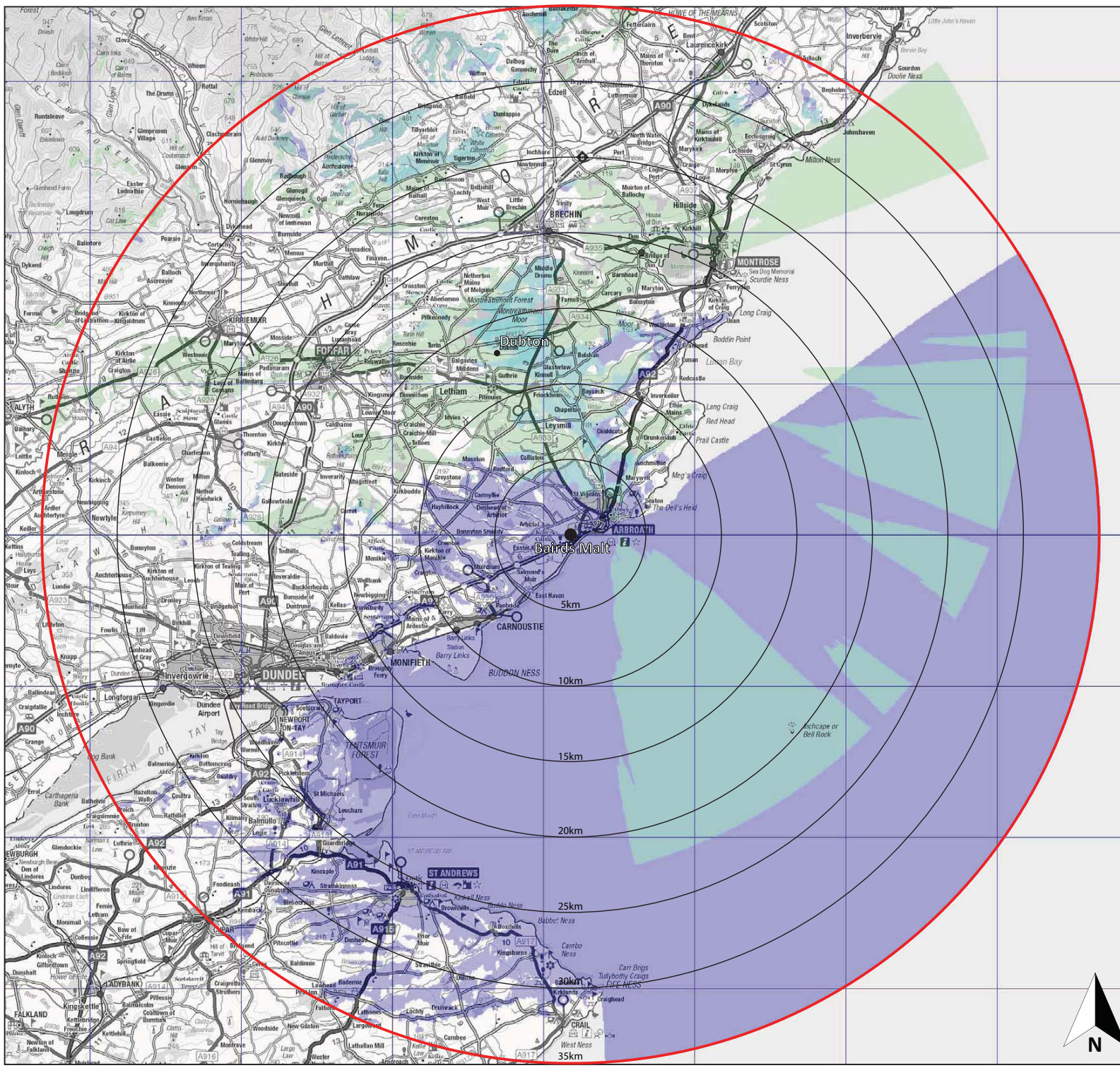

Projects Name: **Bairds Malt Single Turbine**

Document Title: **Cumulative ZTV to Tip Height -  
Dubton Farm (Planning)**

Scale: **1:250,000 @ A3**

Key:

- Proposed Turbine Location
- Other Project Location
- 5, 10, 15, 20, 25 & 30km Radii from Proposed Wind Turbine
- Landscape and Visual Study Area (35km)
- Bairds Malt Visible
- Dubton Farm Visible
- Bairds Malt & Dubton Farm Visible



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Client: **Bairds Malt Single Turbine Ltd**



Drawing by: **Green Cat Renewables Ltd**

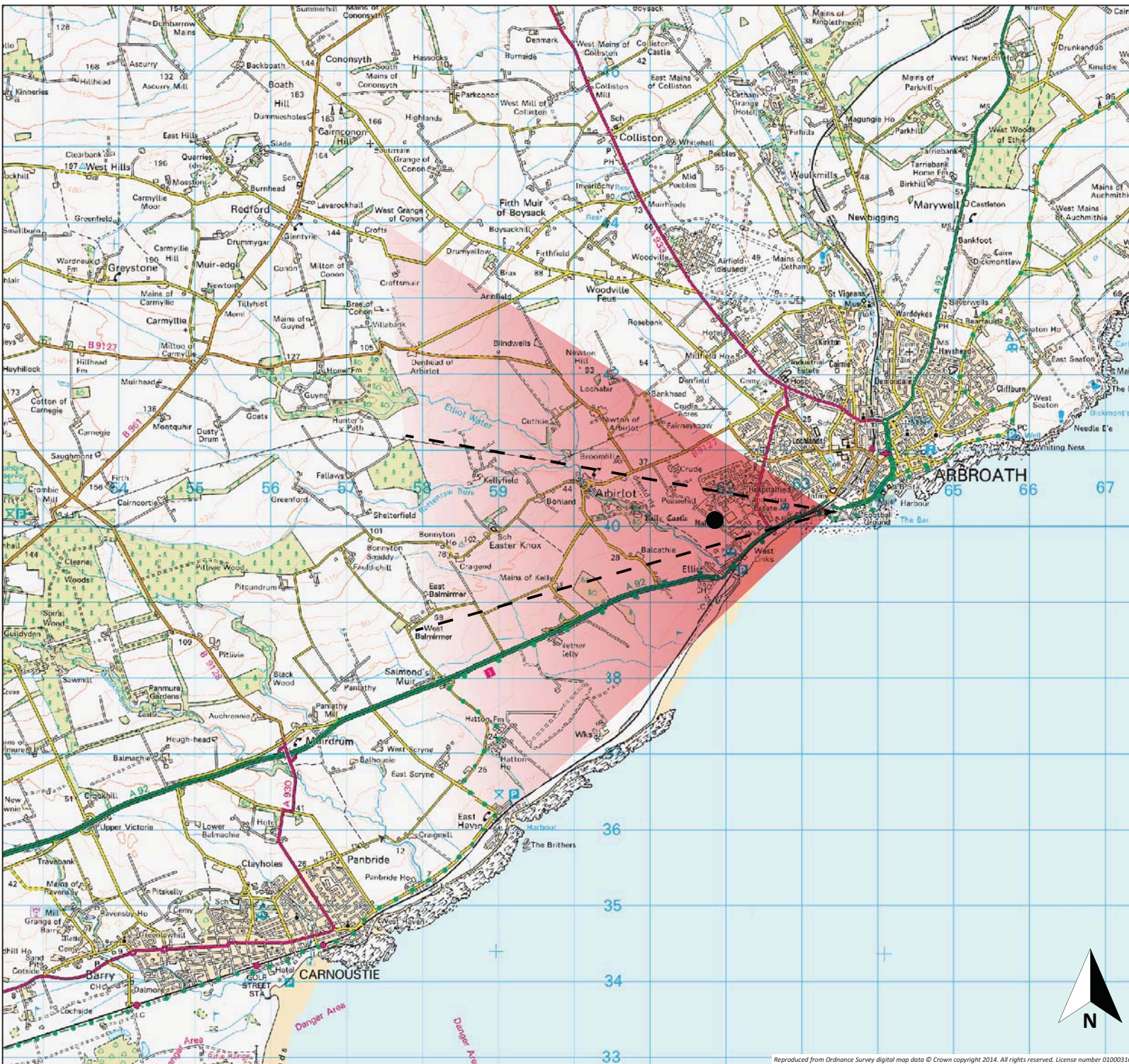
Document Number: **C0621-163/Fig 7.12d**  
Version: **1.0**  
Author: **SS**  
Checked by: **RC**  
Approved By: **GM**  
Date: **17/12/2014**



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Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP01 - Queens Drive, Arbroath

Scale: 1:50,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E363270 N740128**  
 Viewpoint Elevation: **0m (A.O.D)**  
 View Direction: **268°**  
 Distance to Turbine: **1.4km**

Visibility: **6 Projects**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **30/01/2013**  
 Time Taken: **14:37**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Medium**  
 Overall: **Major/Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

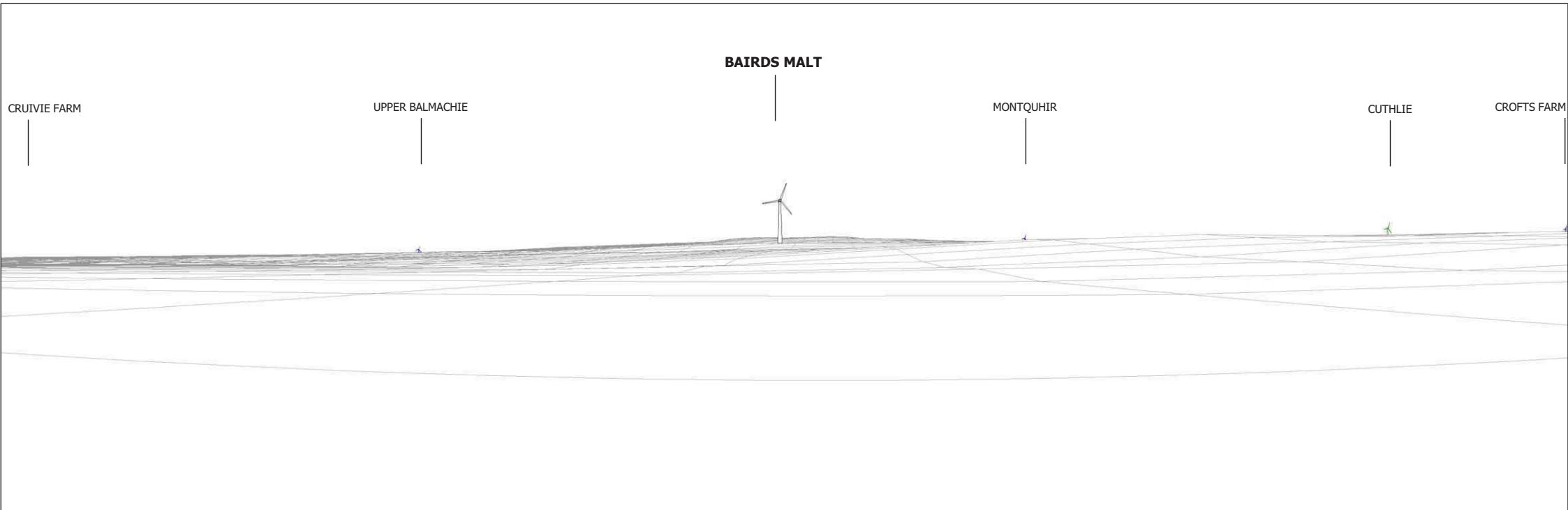
Document Number: **C0621-163/Fig 7.13**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**







VP01 - WIRELINE DRAWING



VP01 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE





VP01 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP02 - Elliot Bridge

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: E362001 N739451

Viewpoint Elevation: 2m (A.O.D)

View Direction: 346°

Distance to Turbine: 0.7km

Visibility: 3 Projects

Camera Type: Nikon D3100

Focal Length: 35mm

Effective Focal Length: 54.6mm

Date Taken: 01/03/2013

Time Taken: 14:03

Height above elevation: 1.5m

### Visual Impact

Magnitude: High

Sensitivity: High

Overall: Major

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/Fig 7.14

Version: 1.0

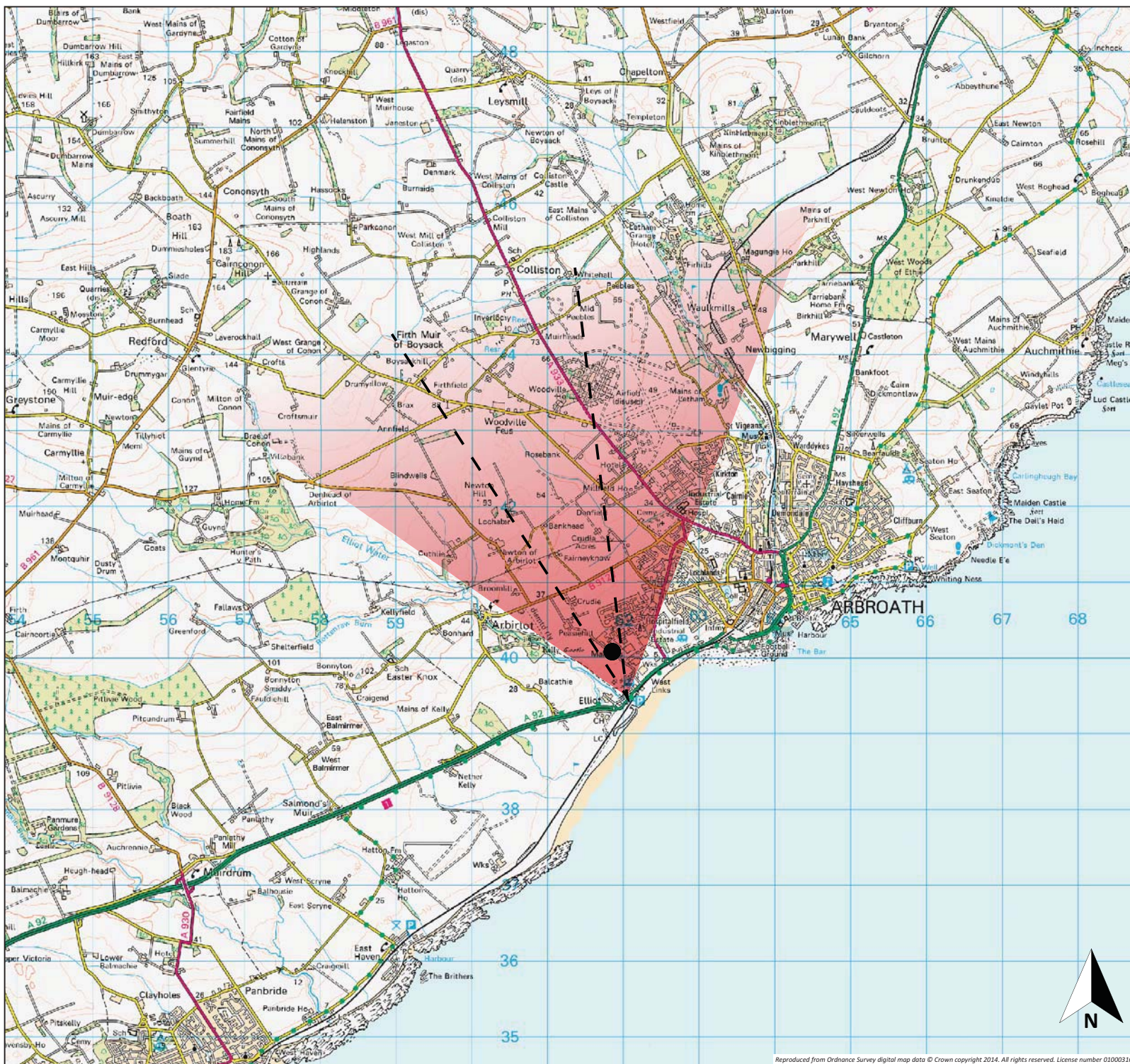
Author: SS

Checked by: RC

Approved By: GM

Date: 17/12/2014

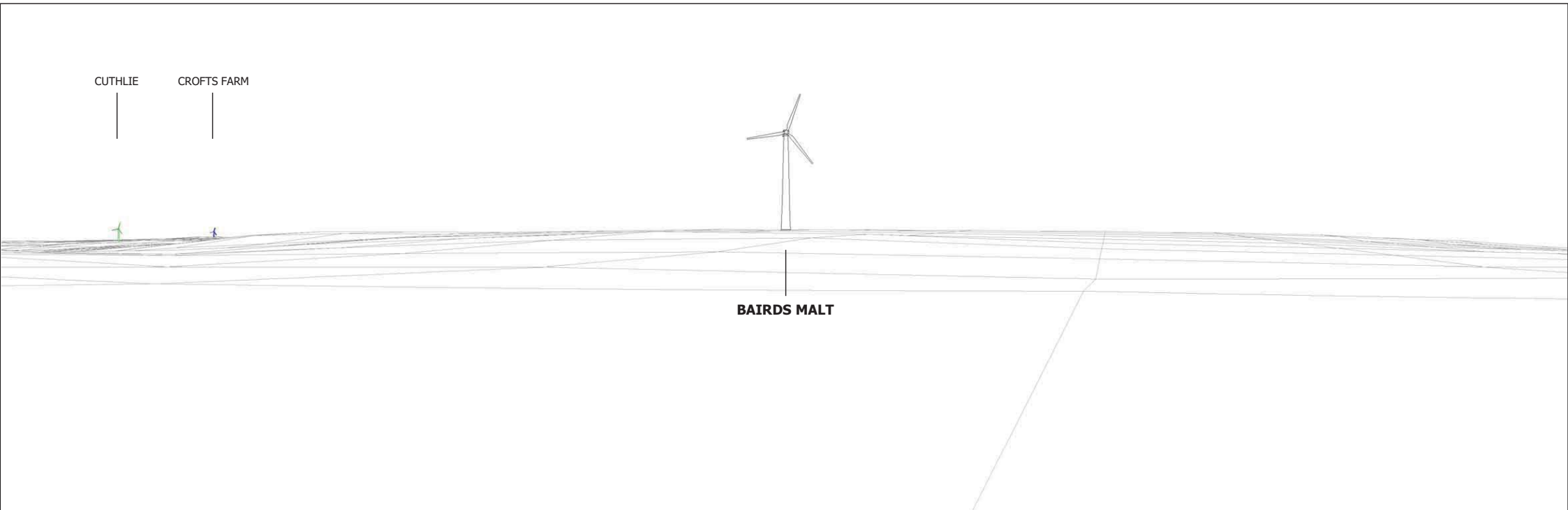
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VP02 - WIRELINE DRAWING



VP02 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



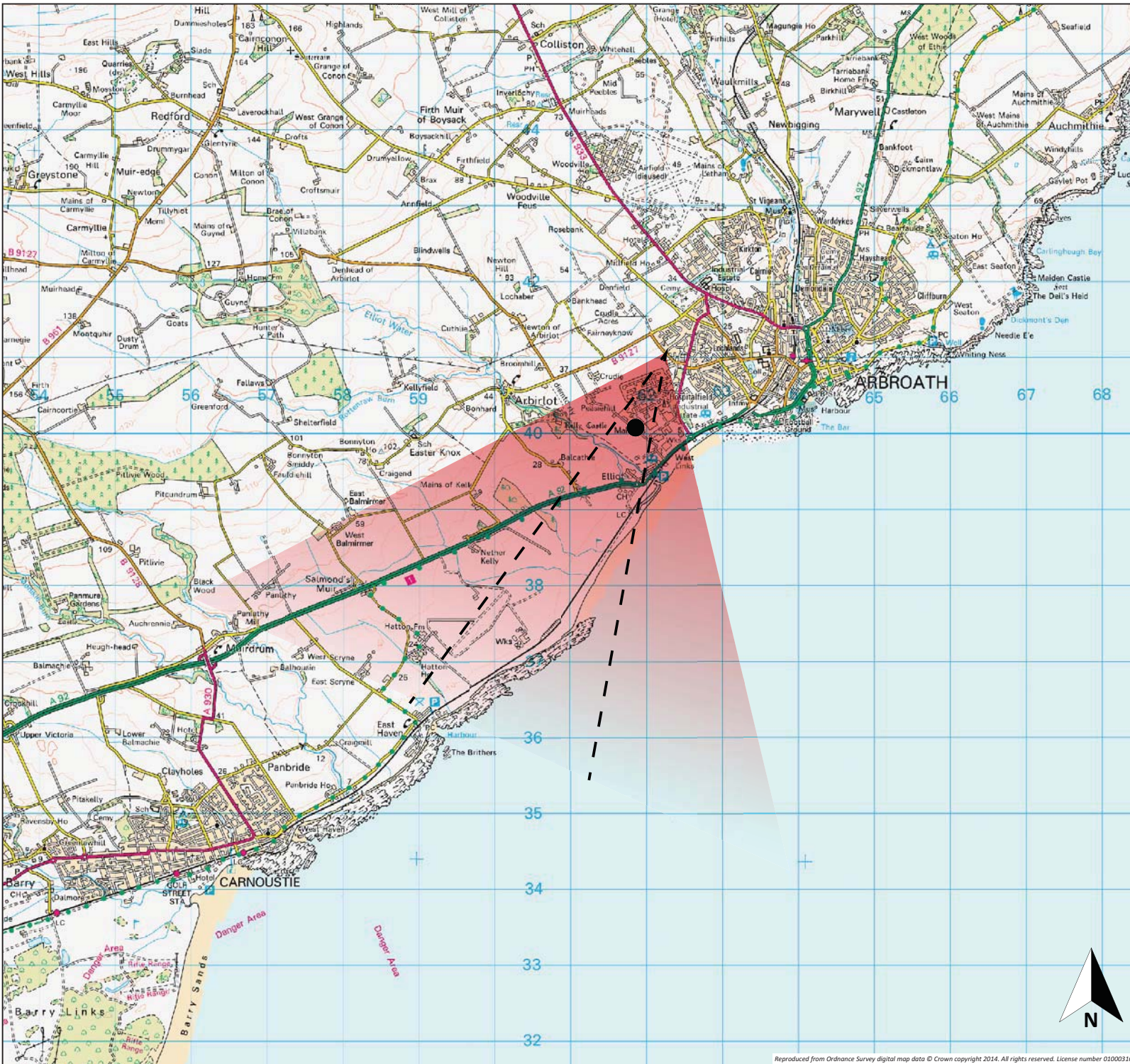


VP02 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE







Project Name: **Bairds Malt Single Turbine**

Document Title: **VP03 - Arbrilot Road West**

Scale: **1:50,000 @ A3**

Key:

-  Proposed Turbine Location
-  76 and 26° Field of View

**Viewpoint Information**

Viewpoint Location: **E362203 N741066**  
 Viewpoint Elevation: **28m (A.O.D)**  
 View Direction: **200°**  
 Distance to Turbine: **1km**

Visibility: **3 Projects**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **04/04/2013**  
 Time Taken: **12:09**  
 Height above elevation: **1.5m**

**Visual Impact**

Magnitude: **High**  
 Sensitivity: **Medium**  
 Overall: **Major/Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: **Bairds Malt Single Turbine Ltd**

Drawing by: **Green Cat Renewables Ltd**

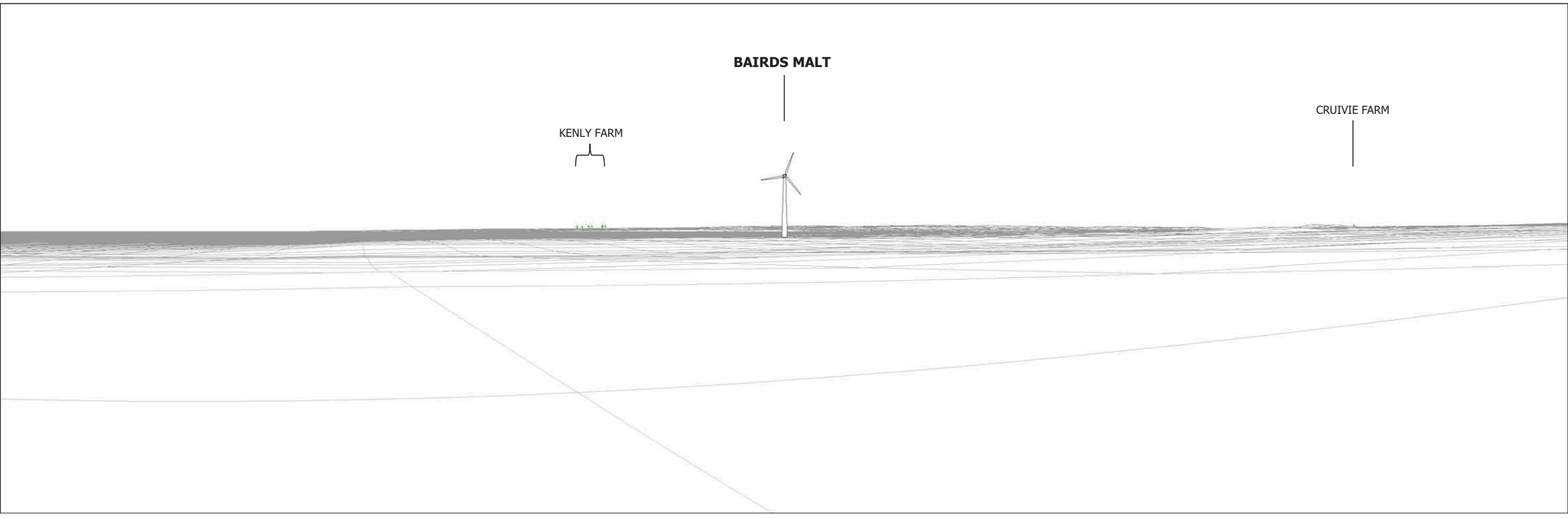
Document Number: **C0621-163/Fig 7.15**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**







VP03 - WIRELINE DRAWING



VP03 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



VP03 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP04 - Boulzie Hill

Scale: 1:50,000 @ A3

Key:

● Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E364569 N740924**

Viewpoint Elevation: **15m (A.O.D)**

View Direction: **252°**

Distance to Turbine: **2.8km**

Visibility: **10 Projects**

Camera Type: **Nikon D3100**

Focal Length: **35mm**

Effective Focal Length: **54.6mm**

Date Taken: **01/03/2013**

Time Taken: **13:23**

Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**

Sensitivity: **Medium**

Overall: **Major/Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/Fig 7.16**

Version: **1.0**

Author: **SS**

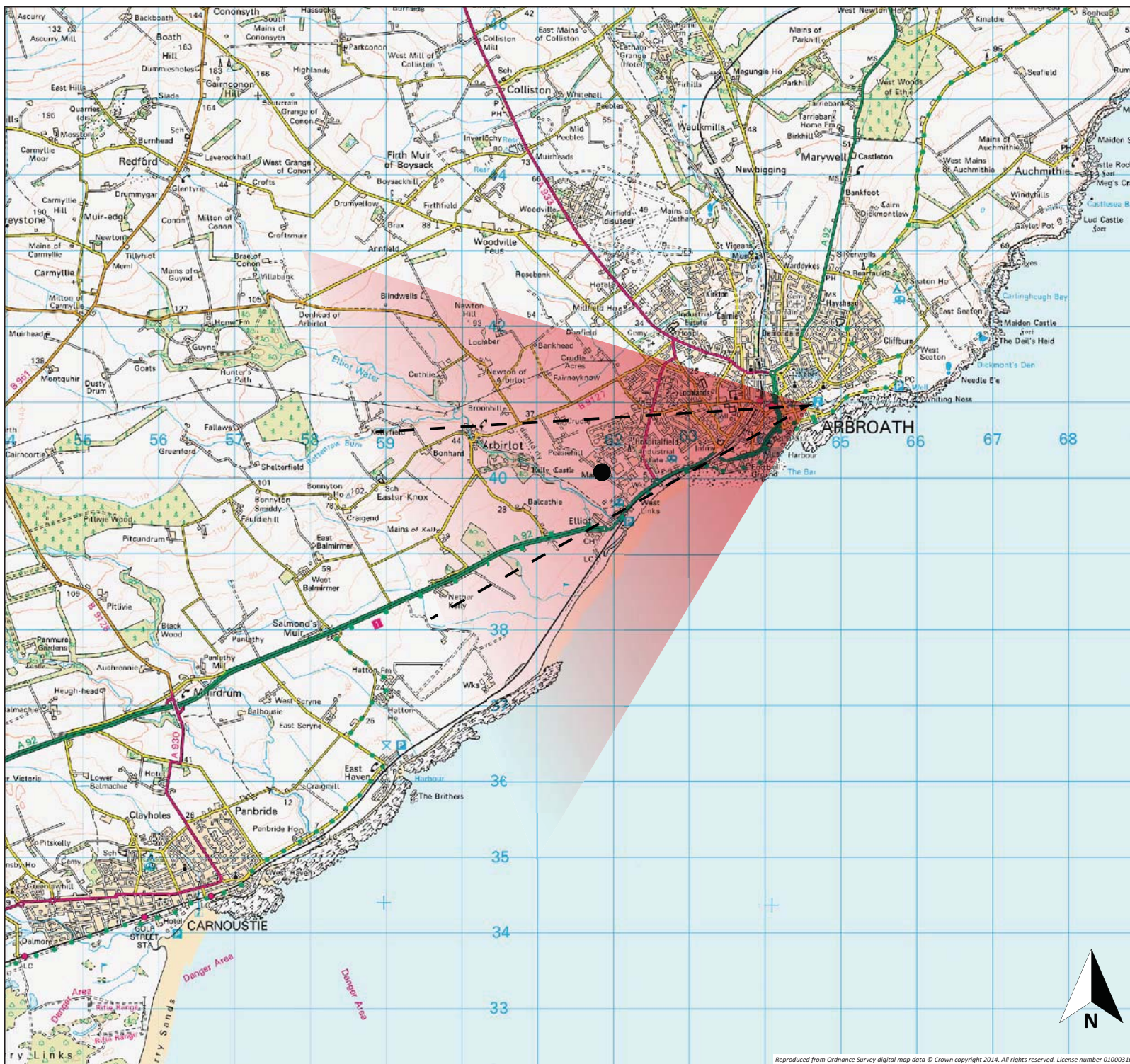
Checked by: **RC**

Approved By: **GM**

Date: **17/12/2014**



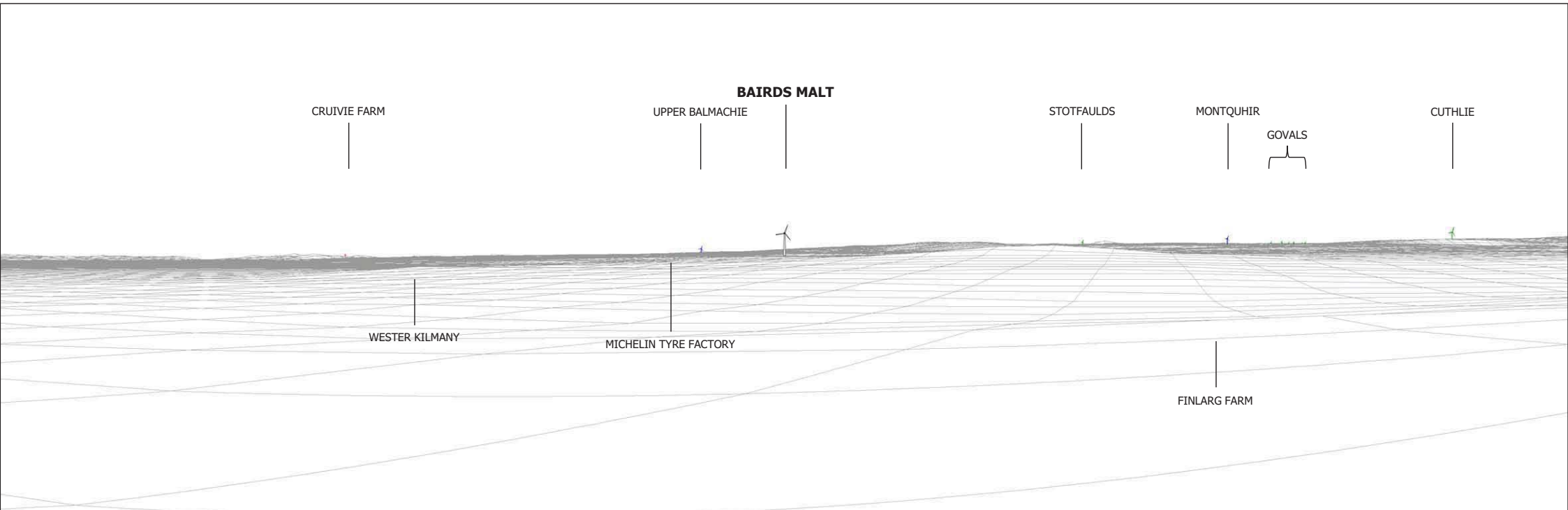
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VP04 - WIRELINE DRAWING



VP04 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE

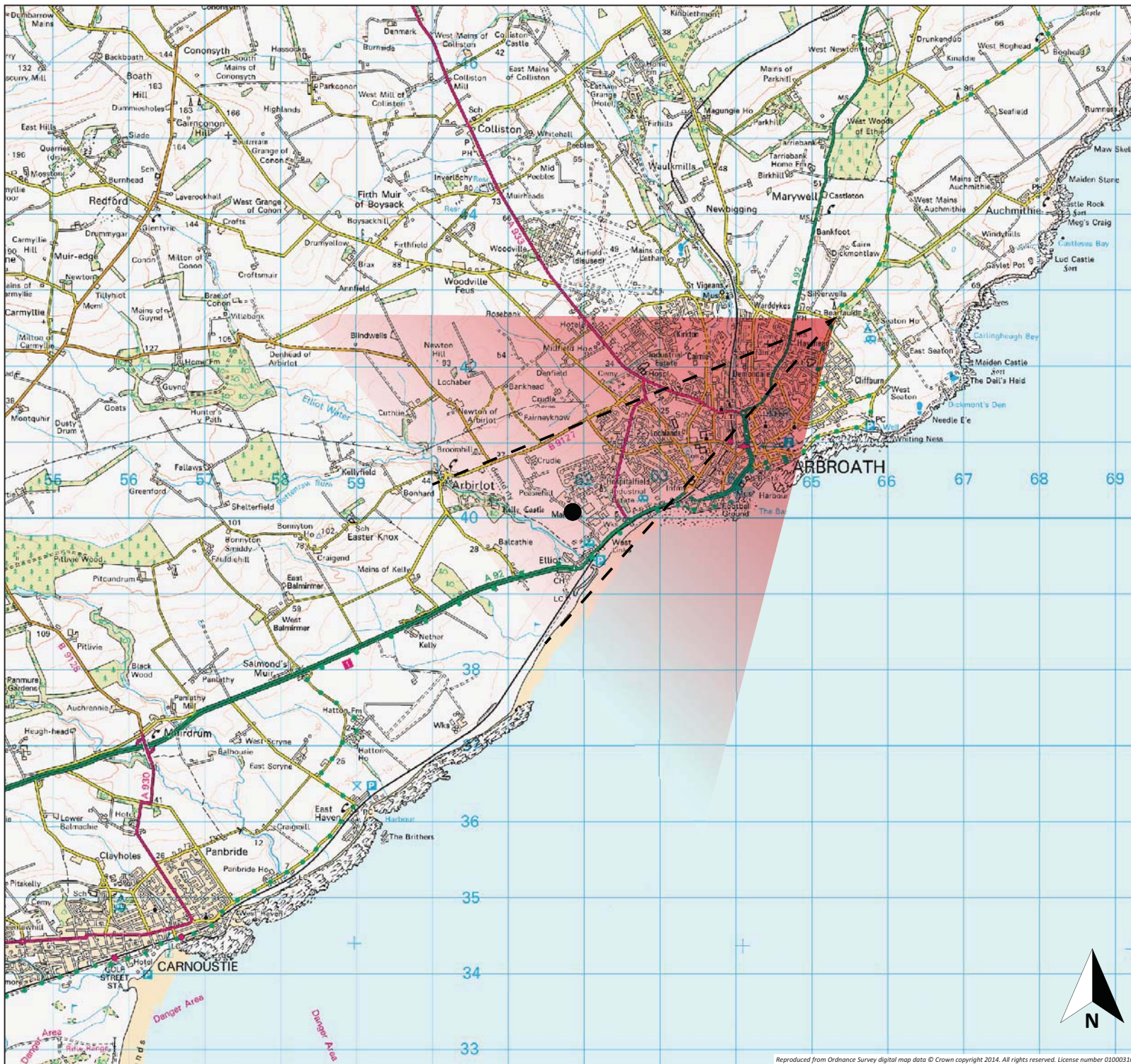


VP04 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP05 - Bearfauld Road

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E365244 N742573**  
 Viewpoint Elevation: **54m (A.O.D)**  
 View Direction: **234°**  
 Distance to Turbine: **4.2km**

Visibility: **12 Projects**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **01/03/2013**  
 Time Taken: **14:21**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Low**  
 Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

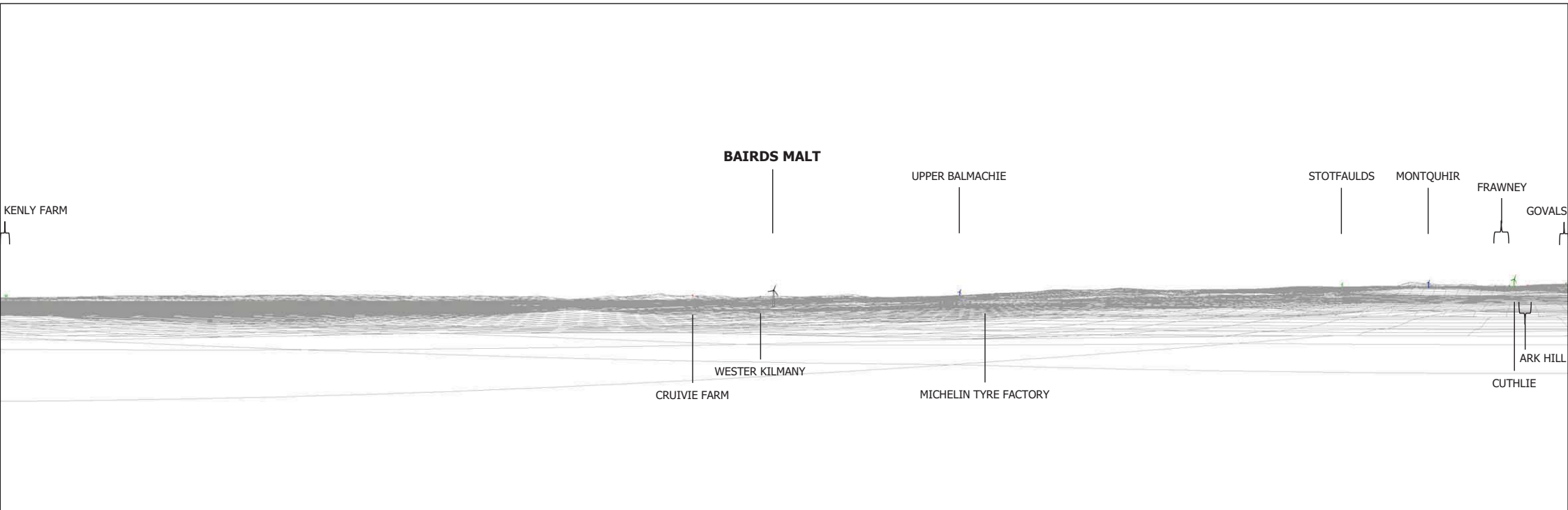
Document Number: **C0621-163/Fig 7.17**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved by: **GM**  
 Date: **17/12/2014**







VP05 - WIRELINE DRAWING





VP05 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE

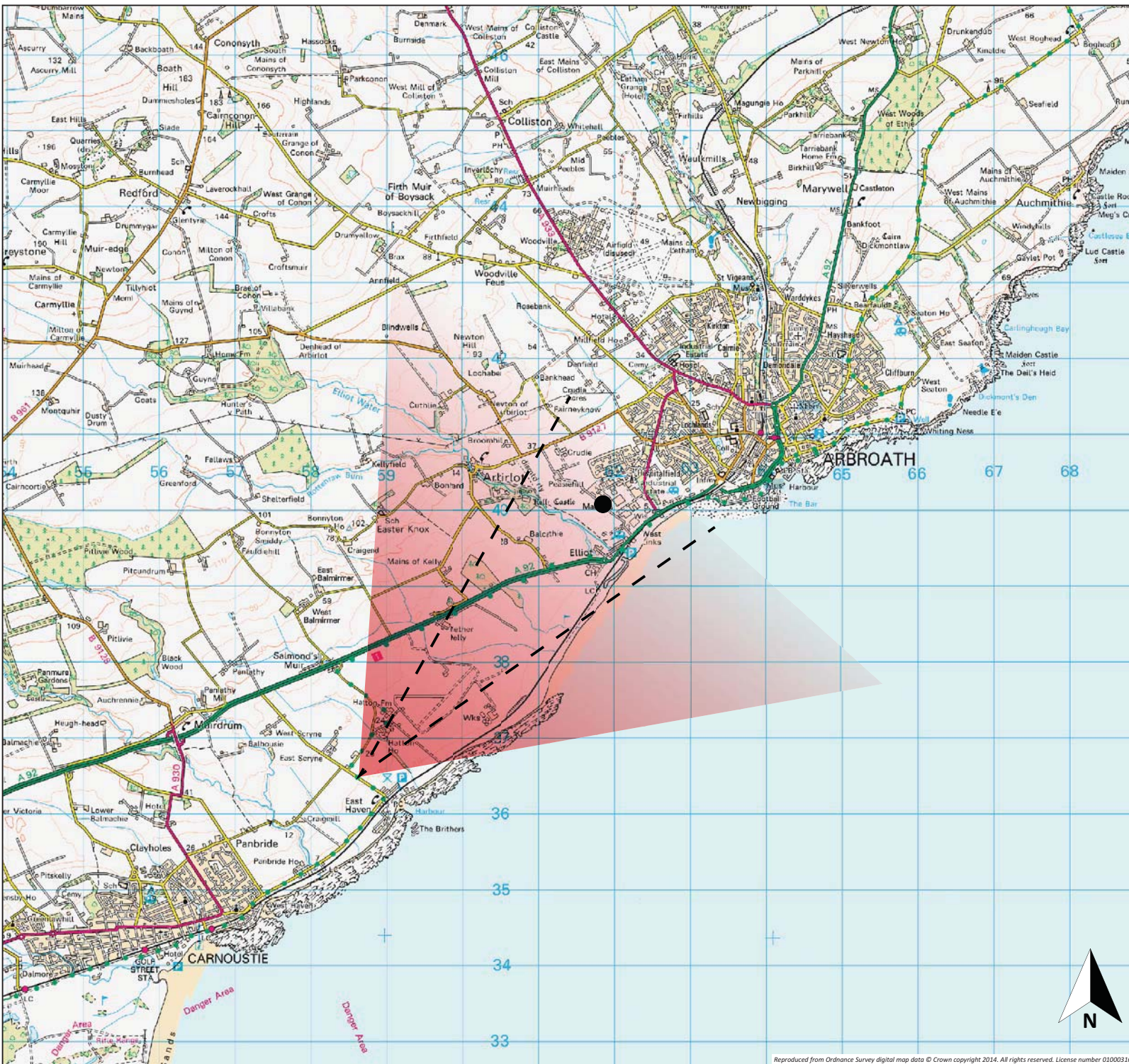


VP05 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine

Document Title: VP06 - East Haven

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E358631 N736475**  
 Viewpoint Elevation: **21m (A.O.D)**  
 View Direction: **42°**  
 Distance to Turbine: **4.8km**

Visibility: **5 Projects**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **01/03/2013**  
 Time Taken: **15:25**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Low**  
 Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

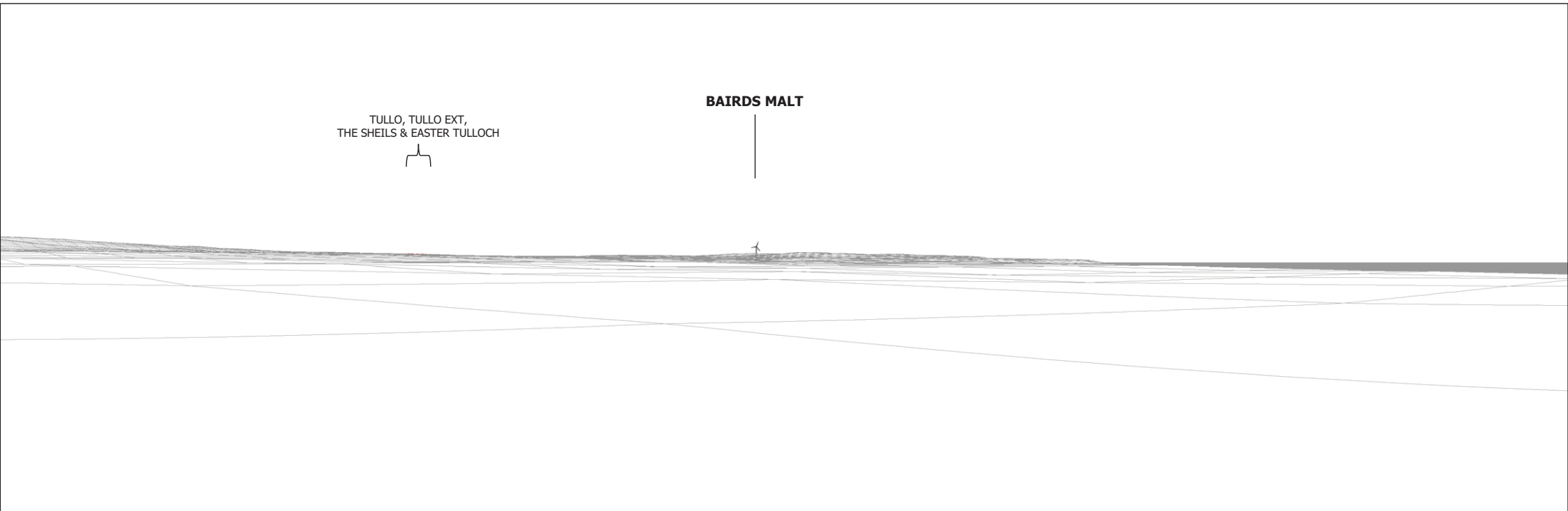
Document Number: **C0621-163/Fig 7.18**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**







VP06 - WIRELINE DRAWING



VP06 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



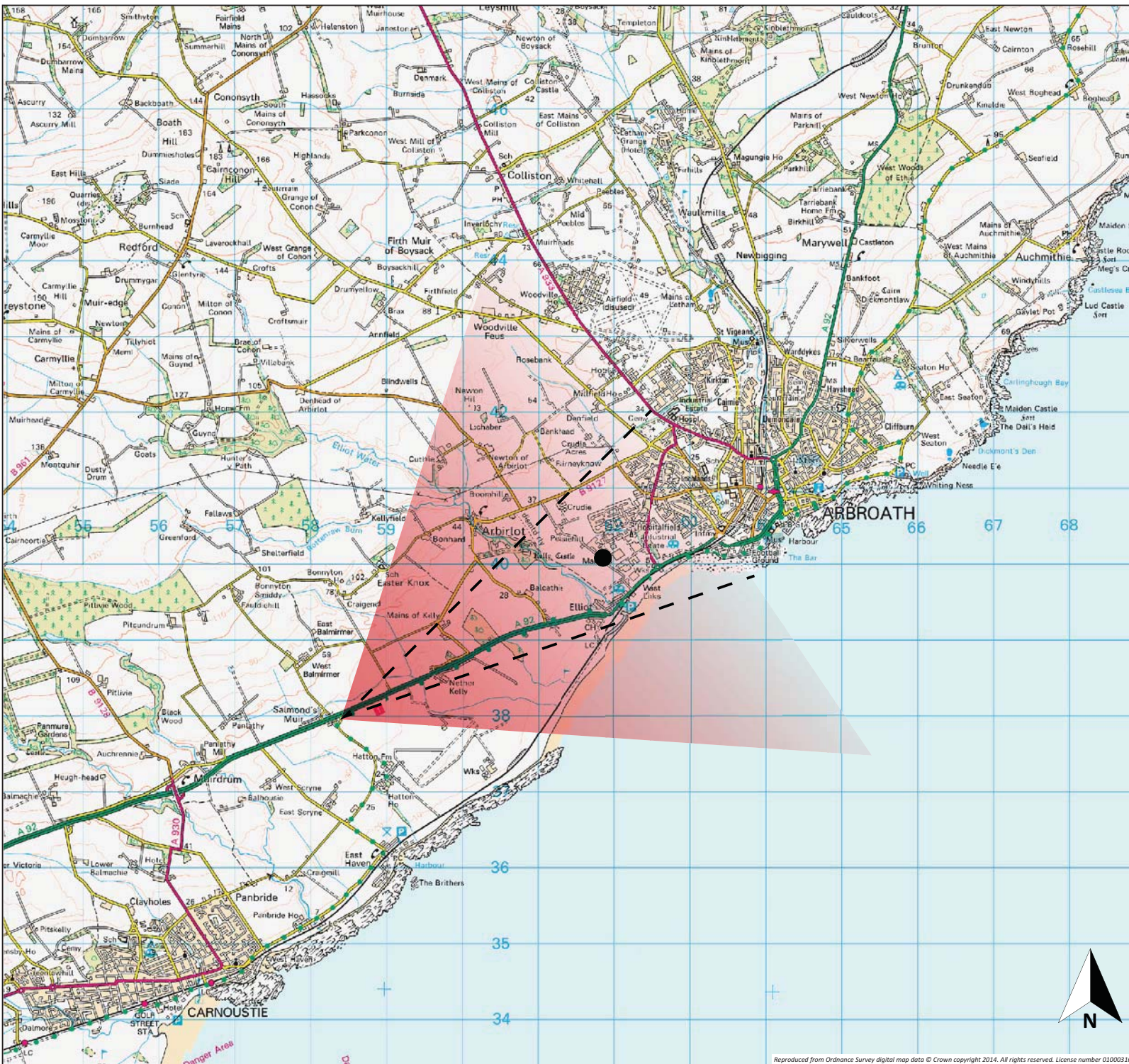


VP06 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP07 - A92, Salmonds Muir

Scale: 1:50,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E358388 N737974**  
 Viewpoint Elevation: **39m (A.O.D)**  
 View Direction: **53°**  
 Distance to Turbine: **4.0km**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **01/03/2013**  
 Time Taken: **15:13**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **Medium**  
 Sensitivity: **Low**  
 Overall: **Moderate/Minor**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

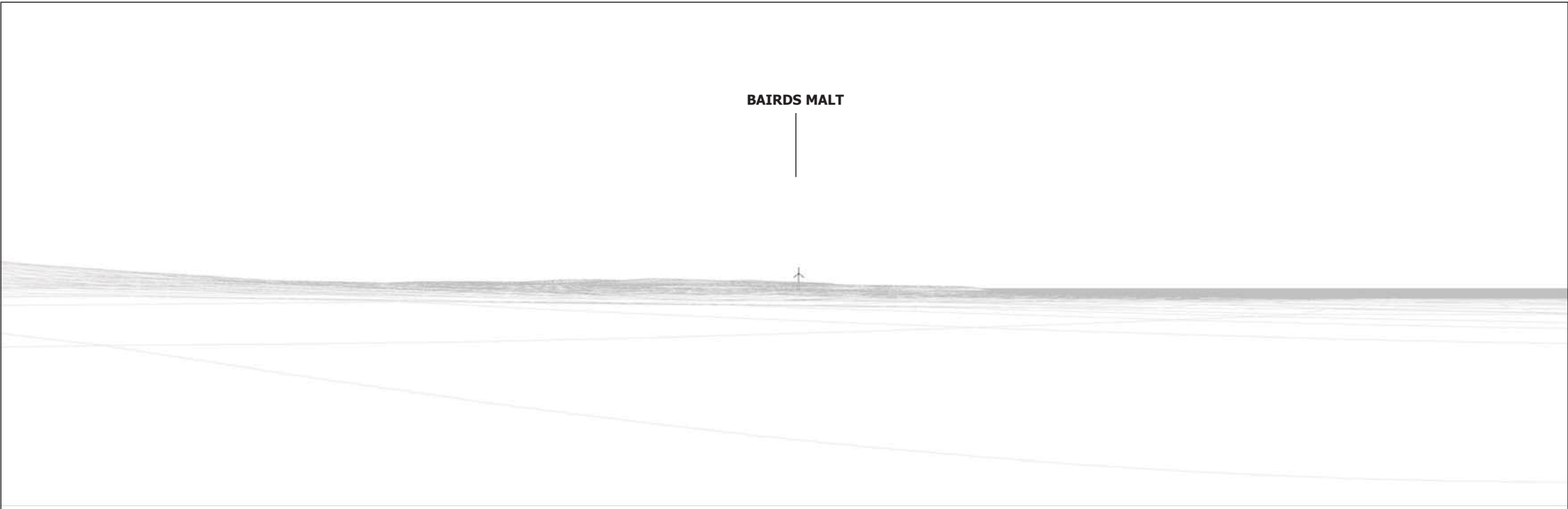
Document Number: **C0621-163/Fig 7.19**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**







VP07 - WIRELINE DRAWING



VP07 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE

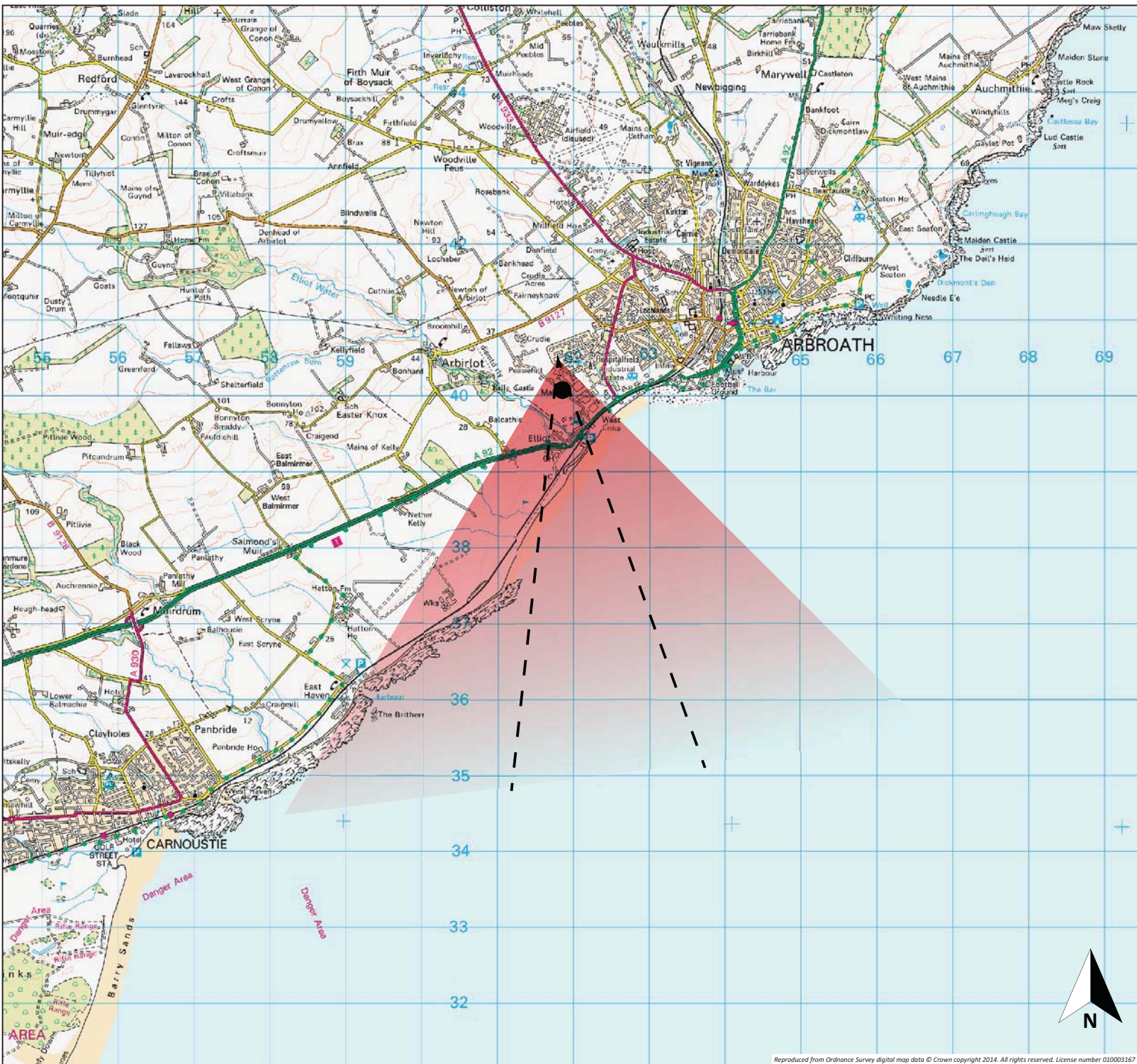


VP07 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE





Project Name: **Bairds Malt Single Turbine**  
 Document Title: **VP08 - Patrick Allan Fraser Street**

Scale: **1:50,000 @ A3**

Key:

- Proposed Turbine Location
- ◀ 76 and 26° Field of View

**Viewpoint Information**

Viewpoint Location: **E361793 N740492**  
 Viewpoint Elevation: **21m (A.O.D)**  
 View Direction: **172°**  
 Distance to Turbine: **0.4km**

Visibility: **Hub**

Camera Type: **Nikon D3100**  
 Focal Length: **35mm**  
 Effective Focal Length: **54.6mm**  
 Date Taken: **04/04/2013**  
 Time Taken: **09:52**  
 Height above elevation: **1.5m**

**Visual Impact**

Magnitude: **High**  
 Sensitivity: **High**  
 Overall: **Major**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: **Bairds Malt Single Turbine Ltd**

Drawing by: **Green Cat Renewables Ltd**

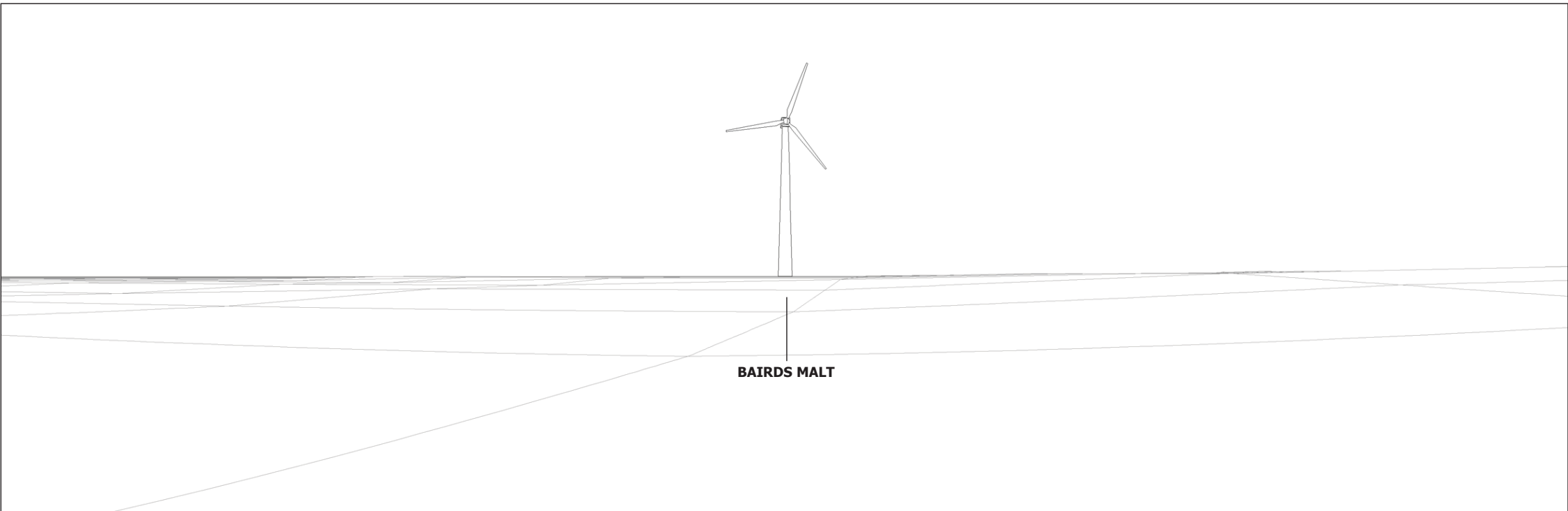
Document Number: **C0621-163/Fig 7.20**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**







VP08 - WIRELINE DRAWING



VP08- PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE





VP08 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine Ltd

Document Title: VP09 - Firthfield

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: E359546 N743455

Viewpoint Elevation: 89m (A.O.D)

View Direction: 144°

Distance to Turbine: 4.1km

Visibility: Hub

Camera Type: Nikon D3100

Focal Length: 35mm

Effective Focal Length: 54.6mm

Date Taken: 04/04/2013

Time Taken: 11:57

Height above elevation: 1.5m

### Visual Impact

Magnitude: High

Sensitivity: Low

Overall: Moderate

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/Fig 7.21

Version: 1.0

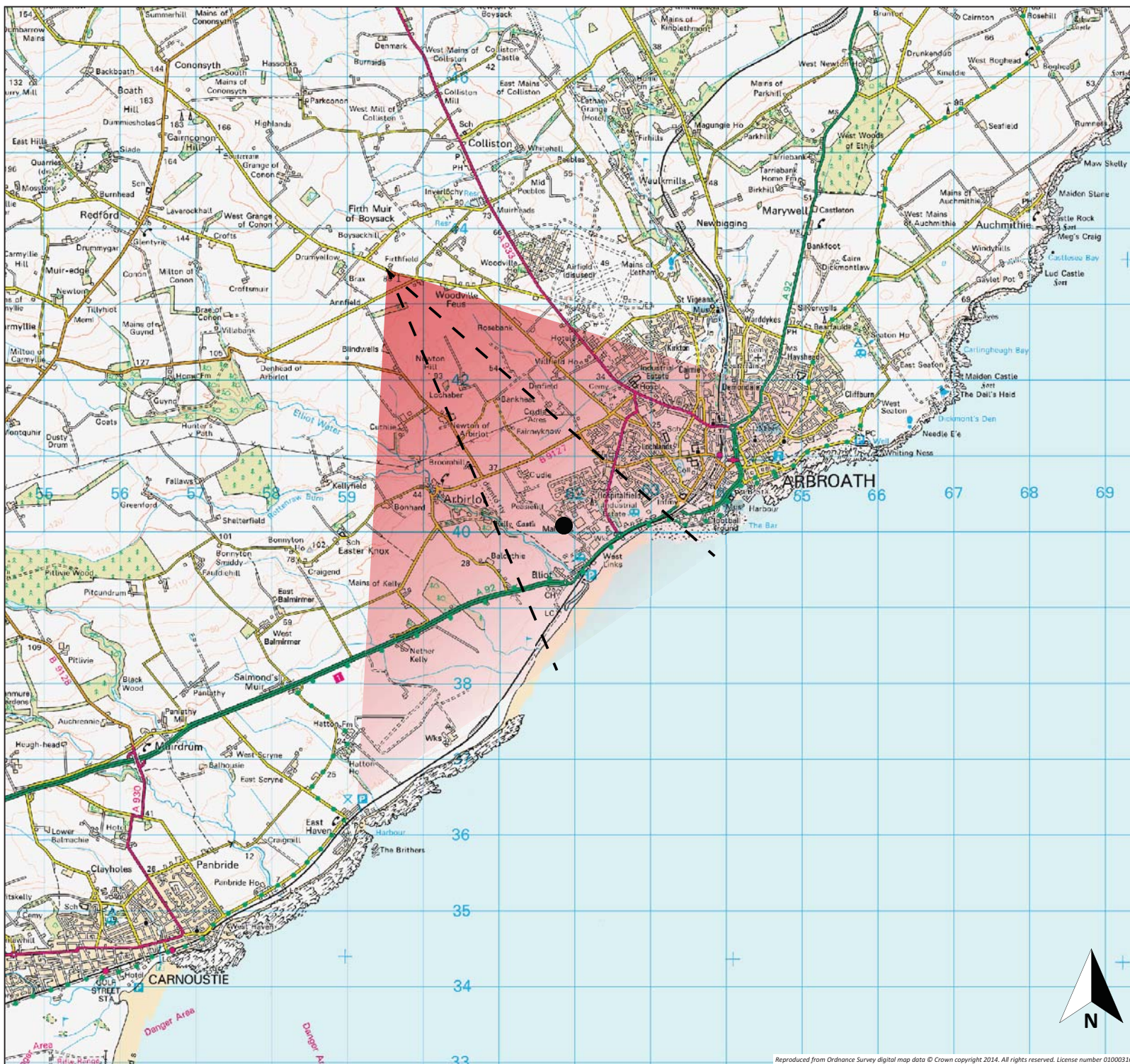
Author: SS

Checked by: RC

Approved By: GM

Date: 17/12/2014

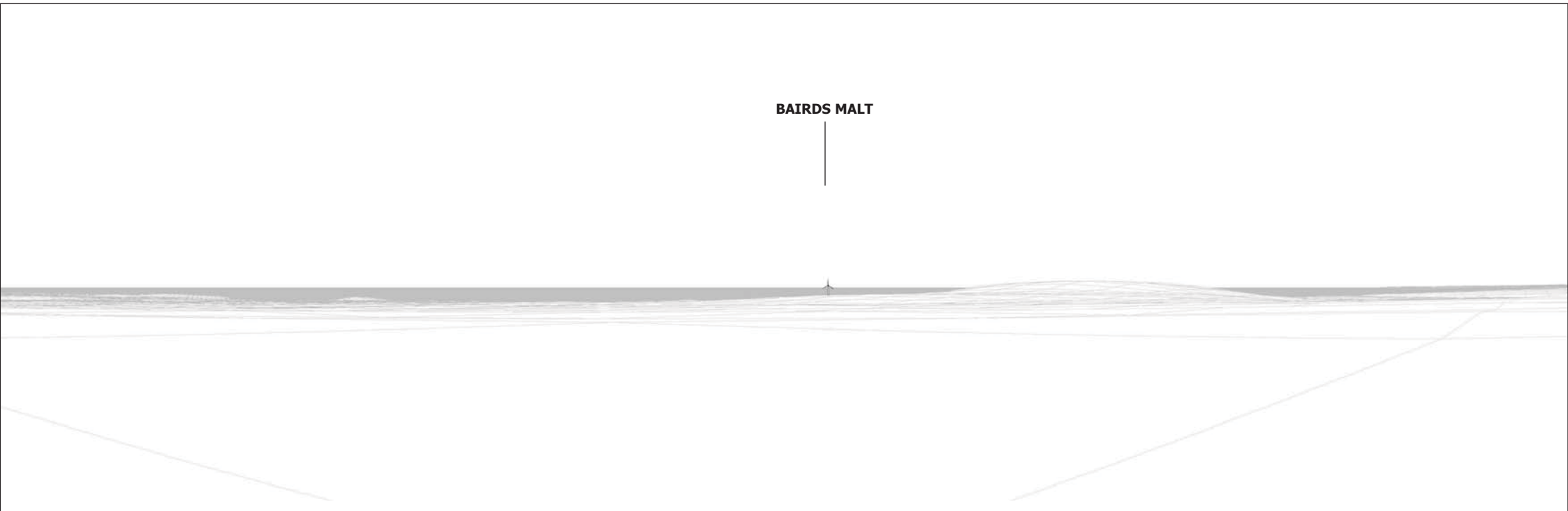
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VP09 - WIRELINE DRAWING



VP09- PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



VP09 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine

Document Title: VP10 - Braeside

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Location



76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: **E359045 N739953**

Viewpoint Elevation: **81m (A.O.D)**

View Direction: **91°**

Distance to Turbine: **2.8km**

Visibility: **Hub**

Camera Type: **Nikon D3100**

Focal Length: **35mm**

Effective Focal Length: **54.6mm**

Date Taken: **22/05/2013**

Time Taken: **10:48**

Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**

Sensitivity: **Low**

Overall: **Moderate**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/Fig 7.22**

Version: **1.0**

Author: **SS**

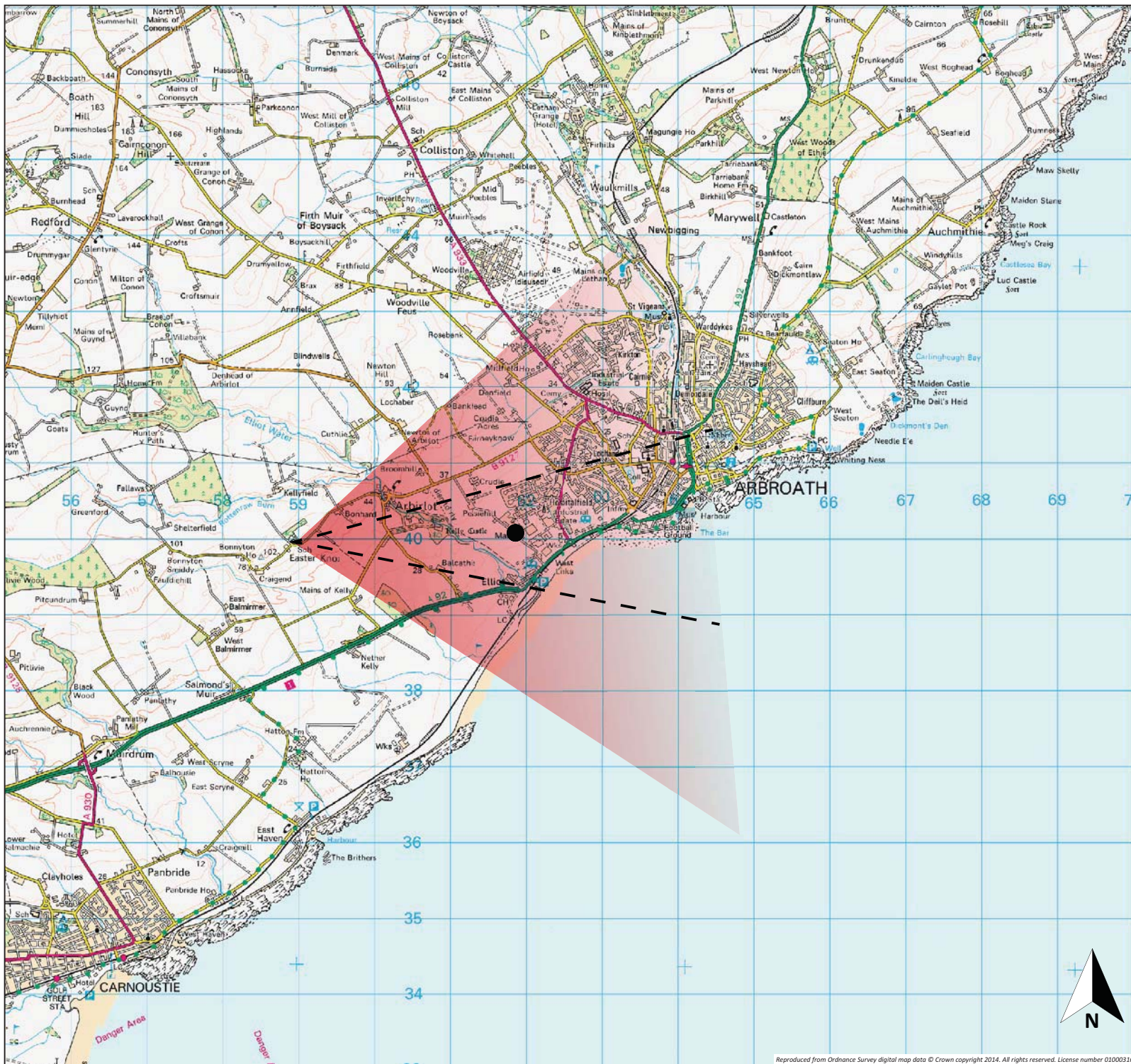
Checked by: **RC**

Approved By: **GM**

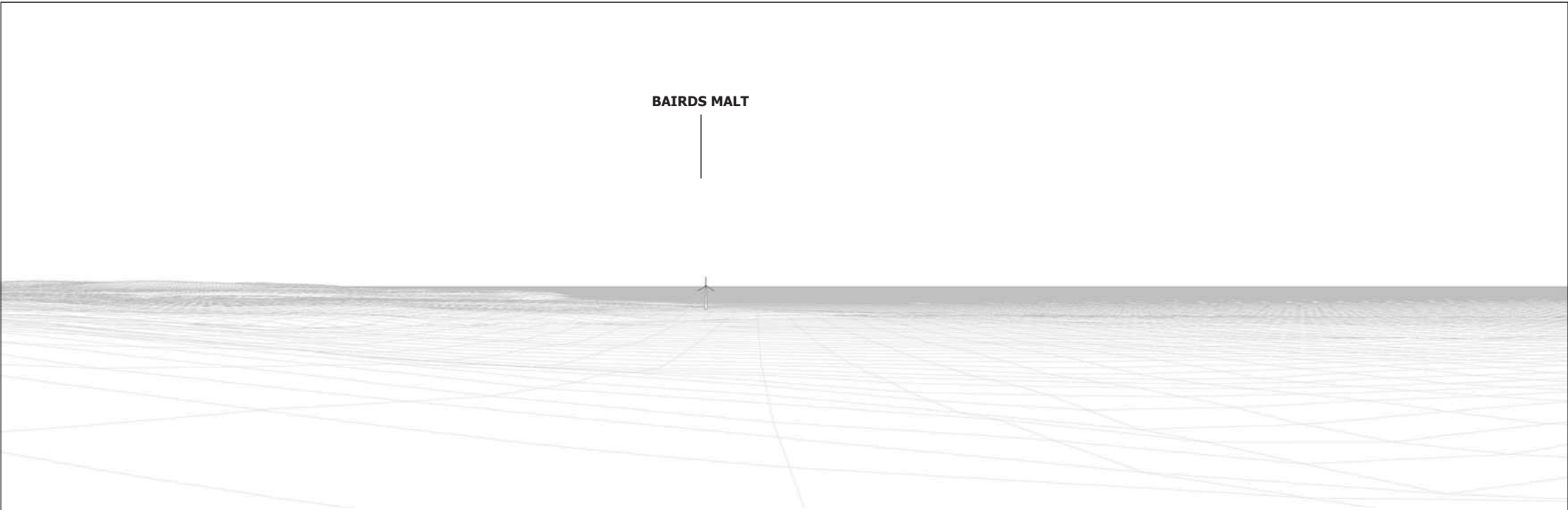
Date: **17/12/2014**



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VP10 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE

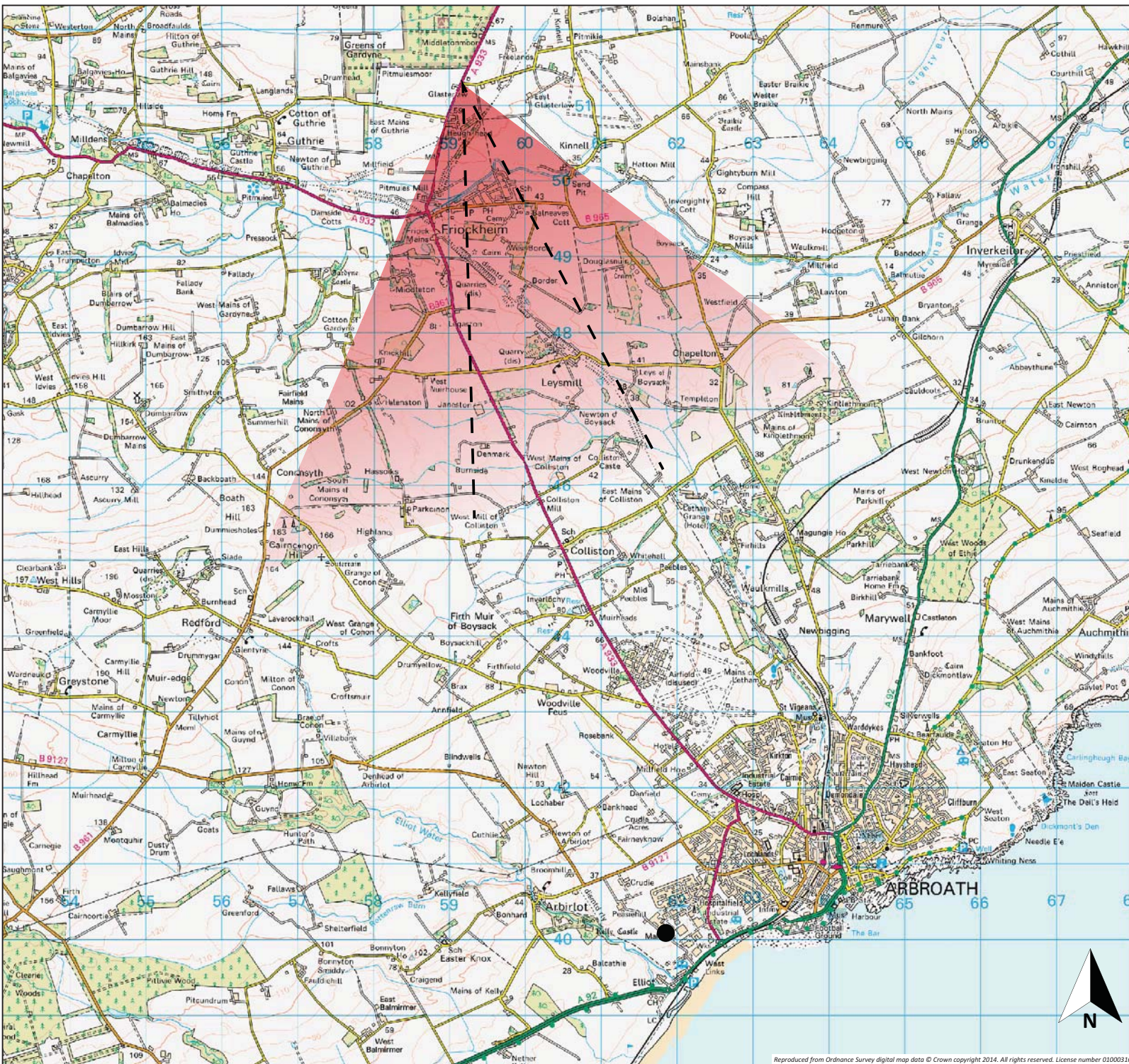


VP10 - 70MM PHOTOMONTAGE OF PROPOSAL




26° VIEWING ANGLE  
500MM VIEWING DISTANCE







**Project Name:** Bairds Malt Single Turbine  
**Document Title:** VP11 - A933 Montreathmont  
**Scale:** 1:50,000 @ A3

**Key:**  
 ● Proposed Turbine Location  
 76 and 26° Field of View

**Viewpoint Information**  
**Viewpoint Location:** E359107 N751263  
**Viewpoint Elevation:** 61m (A.O.D)  
**View Direction:** 174°  
**Distance to Turbine:** 11.5km  
**Visibility:** 4 Projects  
**Camera Type:** Nikon D3100  
**Focal Length:** 35mm  
**Effective Focal Length:** 54.6mm  
**Date Taken:** 17/06/2014  
**Time Taken:** 15:30  
**Height above elevation:** 1.5m

**Visual Impact**  
**Magnitude:** Medium  
**Sensitivity:** Negligible  
**Overall:** Minor  
  
*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

**Client:** Bairds Malt Single Turbine Ltd  
  
**Drawing by:** Green Cat Renewables Ltd  


**Document Number:** C0621-163/Fig 7.23  
**Version:** 1.0  
**Author:** SS  
**Checked by:** RC  
**Approved By:** GM  
**Date:** 17/12/2014  
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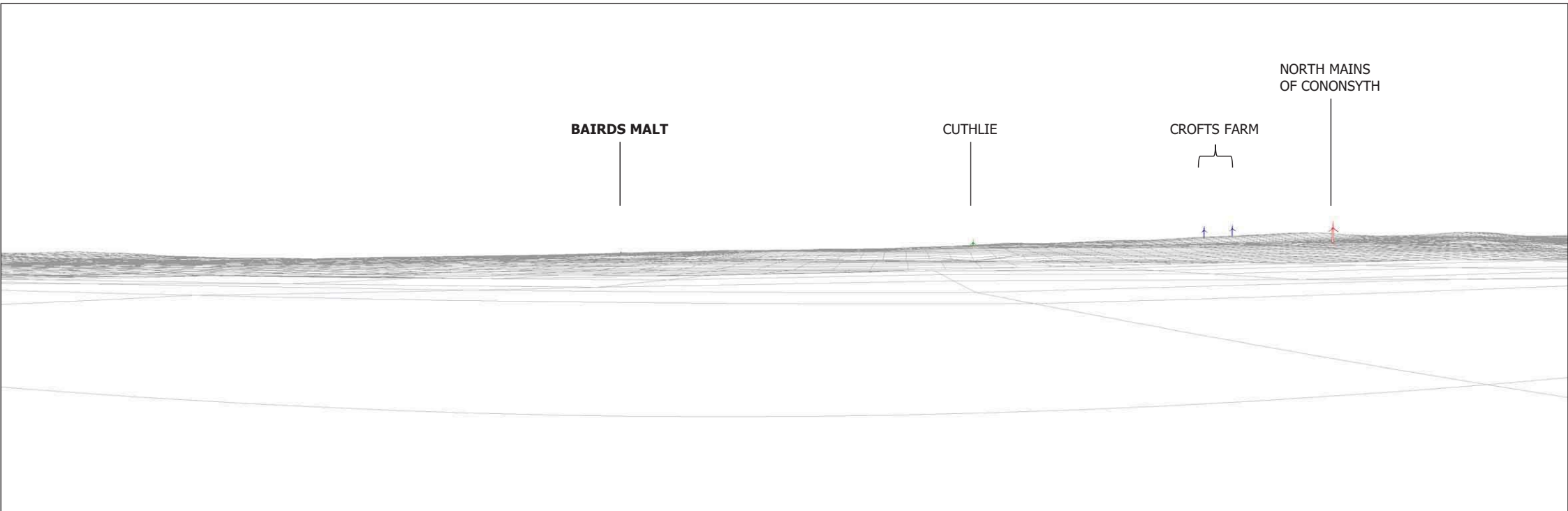
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VP11 - PHOTOGRAPH OF EXISTING VIEW



VP11 - WIRELINE DRAWING

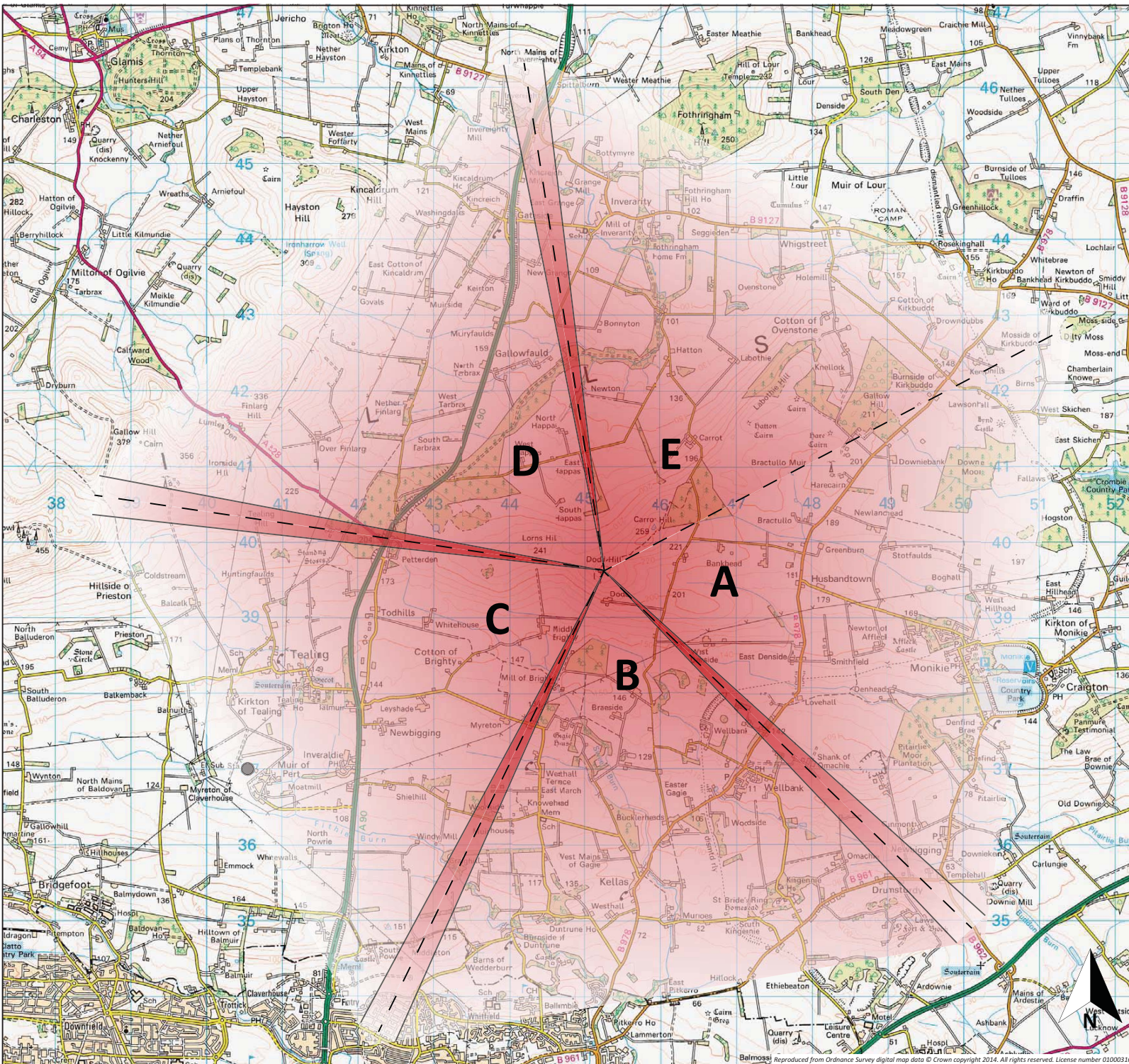


VP11- PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE







Project Name: Bairs Malt Single Turbine Ltd

Document Title: VP12 - Dodd Hill

Scale: 1:50,000 @ A3

- Key:
- Proposed Turbine Locations
  - ◀ 76° Field of View
  - ◀ 5° Overlap

### Viewpoint Information

Viewpoint Location: E345256 N739618  
 Viewpoint Elevation: 251m (A.O.D)  
 View Direction: A. 93° B. 164° C. 235°  
 D. 306° E. 17°  
 Distance to Turbine: 16.6km

Visibility: A. 7 Projects B. 4 Projects  
 C. 4 Projects D. 2 Projects  
 E. 15 Projects

Camera Type: Nikon D70s  
 Focal Length: 35mm  
 Effective Focal Length: 53.4 mm  
 Date Taken: 01/11/2008  
 Time Taken: 14:00  
 Height above elevation: 1.5m

### Visual Impact

Sensitivity: High  
 Magnitude: Negligible  
 Overall: Moderate/Minor

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairs Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

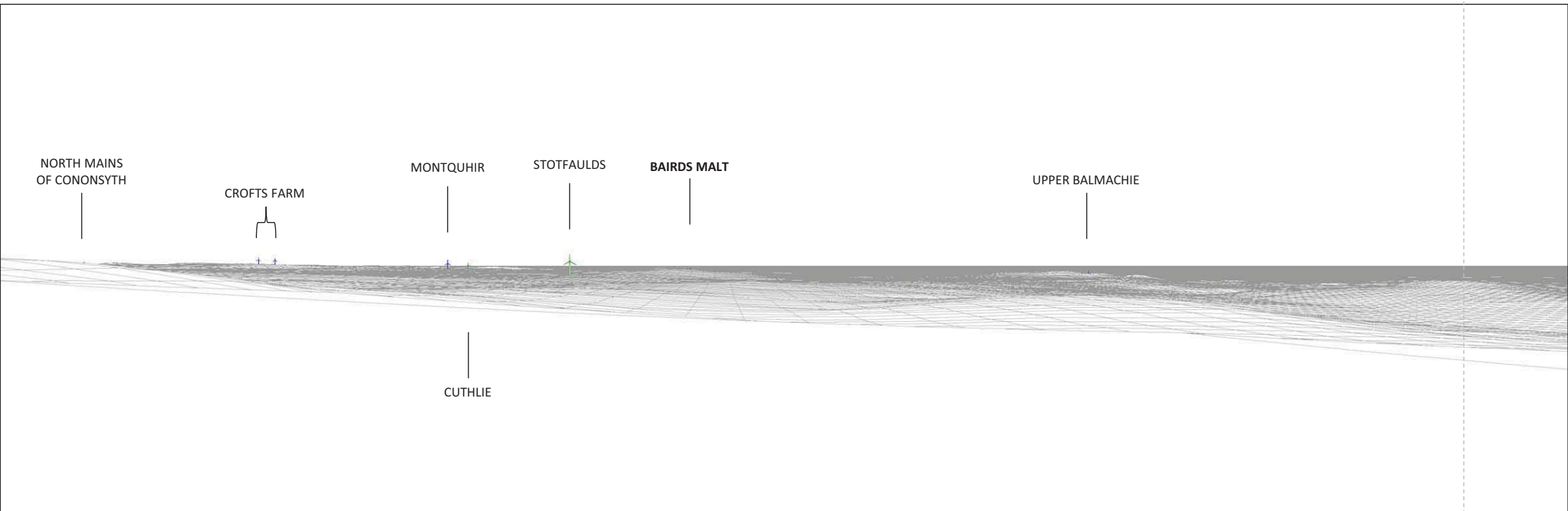
Document Number: C0621-163/Fig 7.24  
 Version: 1.0  
 Author: SS  
 Checked by: RC  
 Approved By: GM  
 Date: 17/12/2014





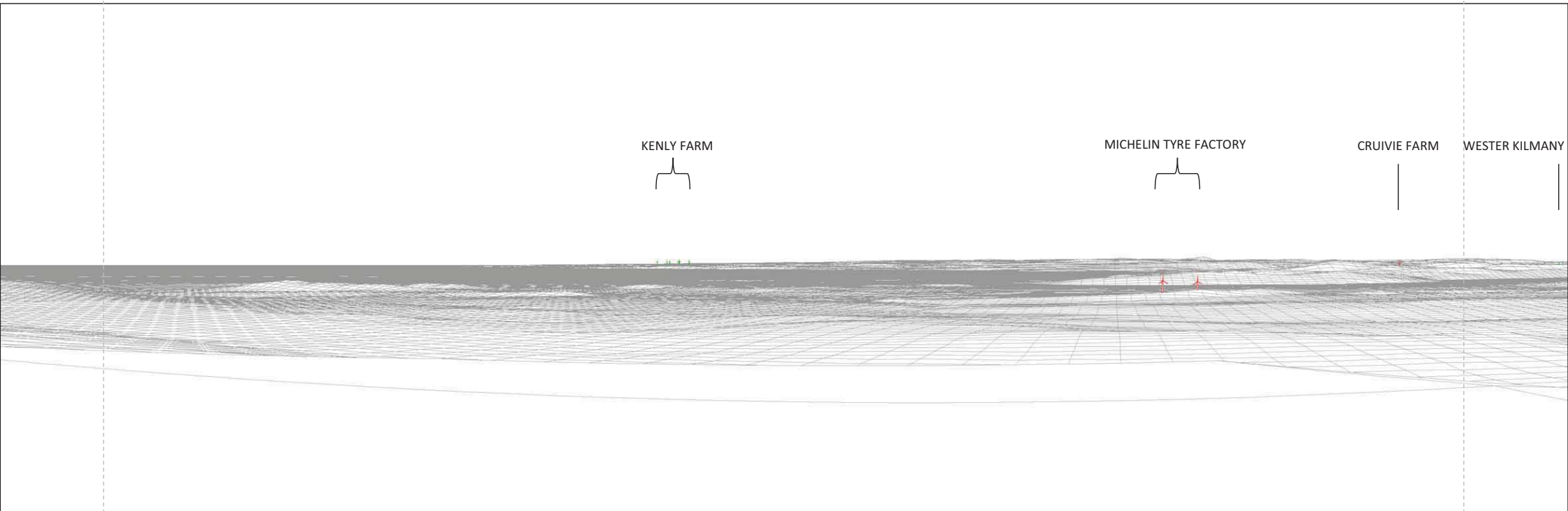


VP12A DODD HILL - WIRELINE DRAWING



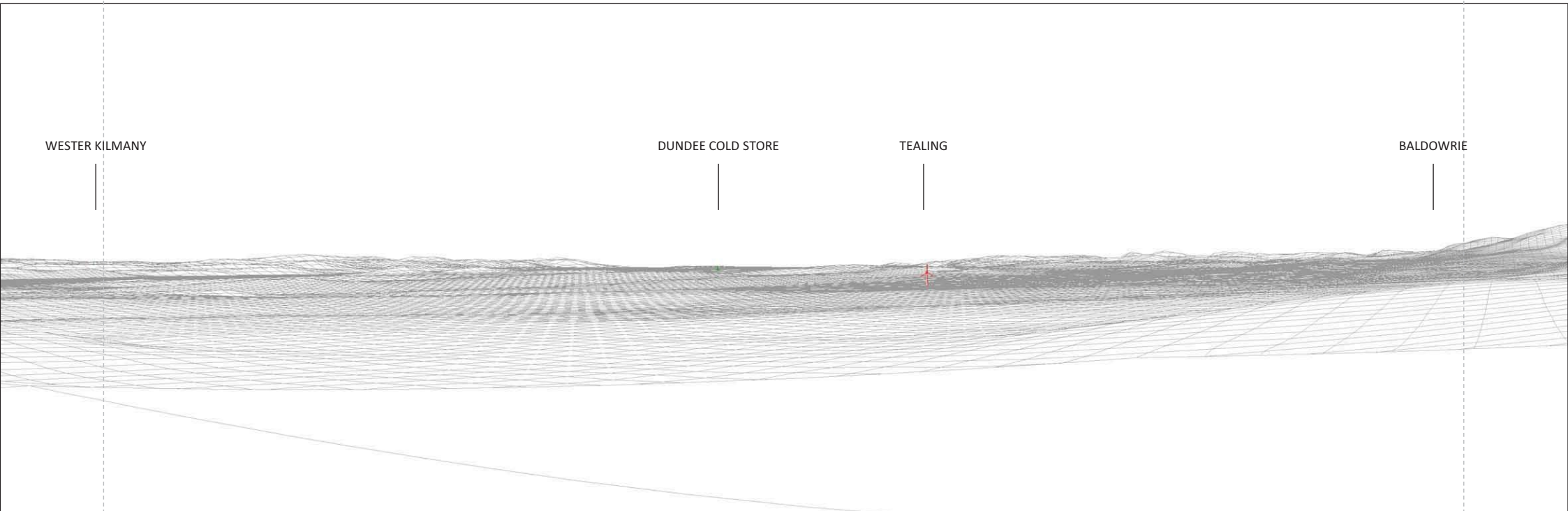


VP12B DODD HILL - WIRELINE DRAWING





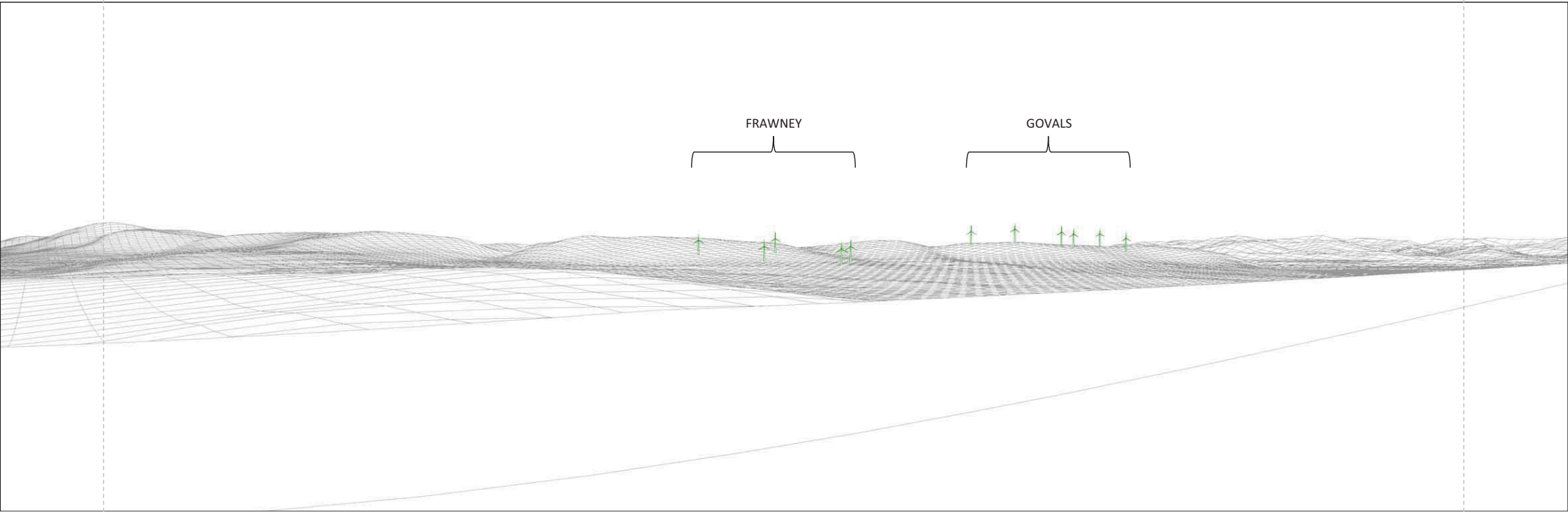
VP12C DODD HILL - WIRELINE DRAWING







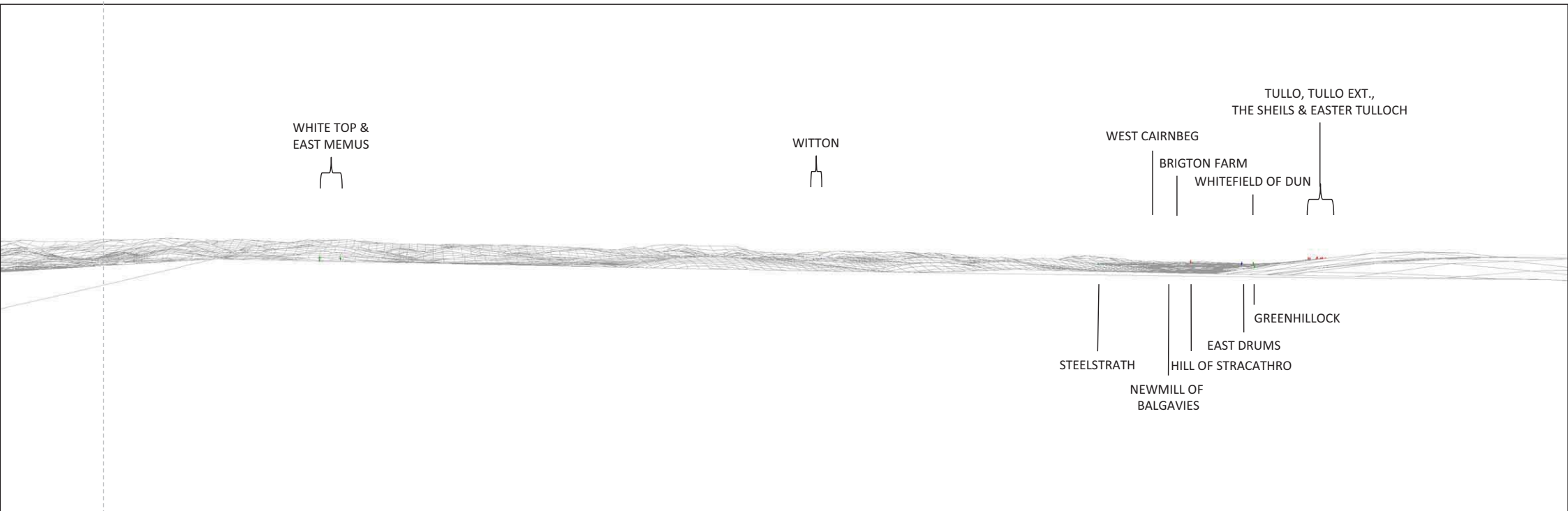
VP12D DODD HILL - WIRELINE DRAWING



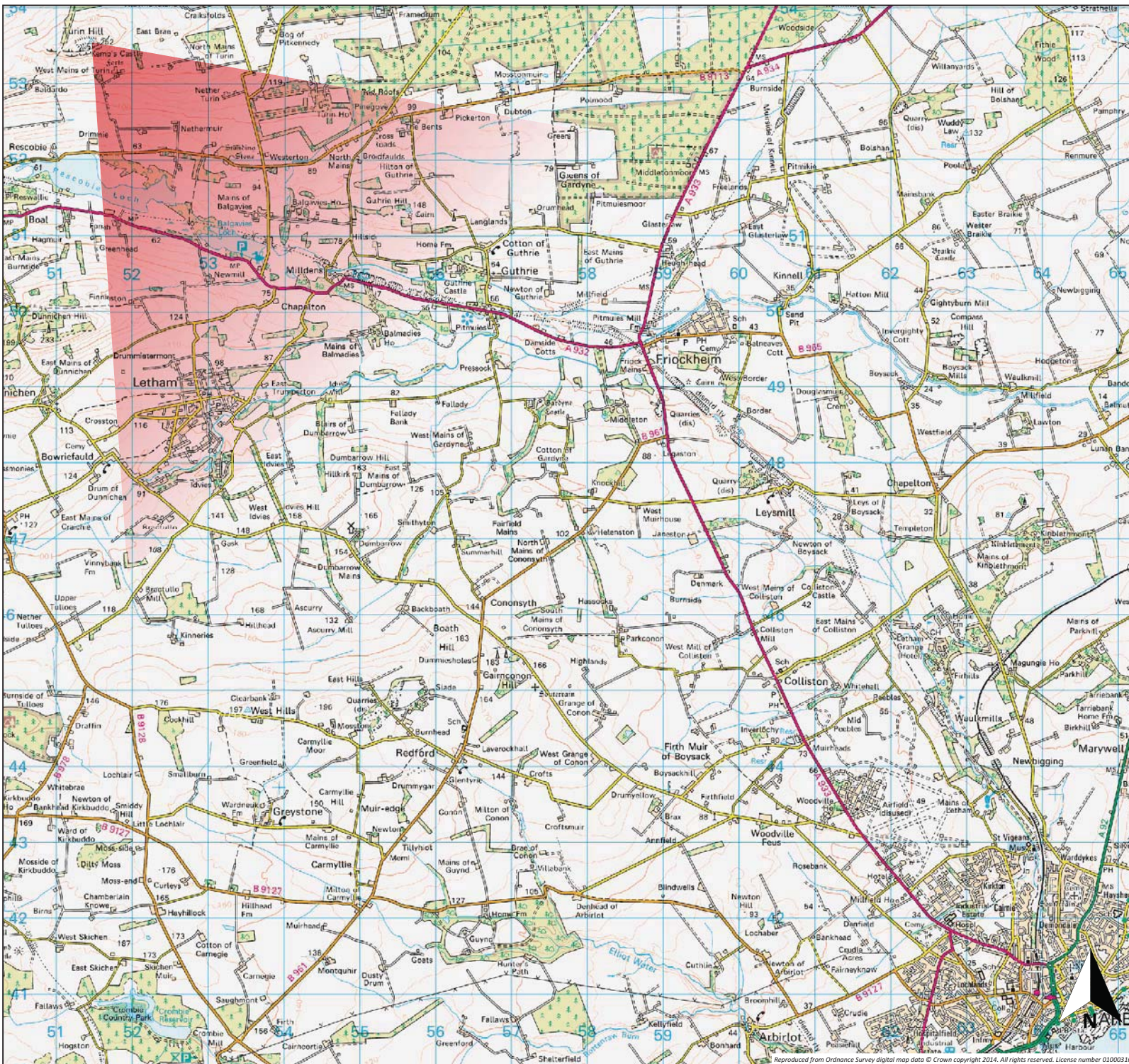




VP12E DODD HILL - WIRELINE DRAWING





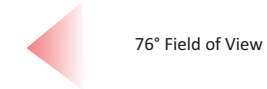


Project Name: Bairds Malt Single Turbine

Document Title: VP13 - Turin Hill

Scale: 1:50,000 @ A3

Key: ● Proposed Turbine Location



76° Field of View

### Viewpoint Information

Viewpoint Location: **E351395 N753524**  
 Viewpoint Elevation: **241m (A.O.D)**  
 View Direction: **148°**  
 Distance to Turbine: **17.1km**

Visibility: **7 Projects**

Camera Type: **Nikon D70S**  
 Focal Length: **35mm**  
 Effective Focal Length: **53.4mm**  
 Date Taken: **26/07/2011**  
 Time Taken: **10:18**  
 Height above elevation: **1.5m**

### Visual Impact

Magnitude: **High**  
 Sensitivity: **Negligible**  
 Overall: **Moderate/Minor**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

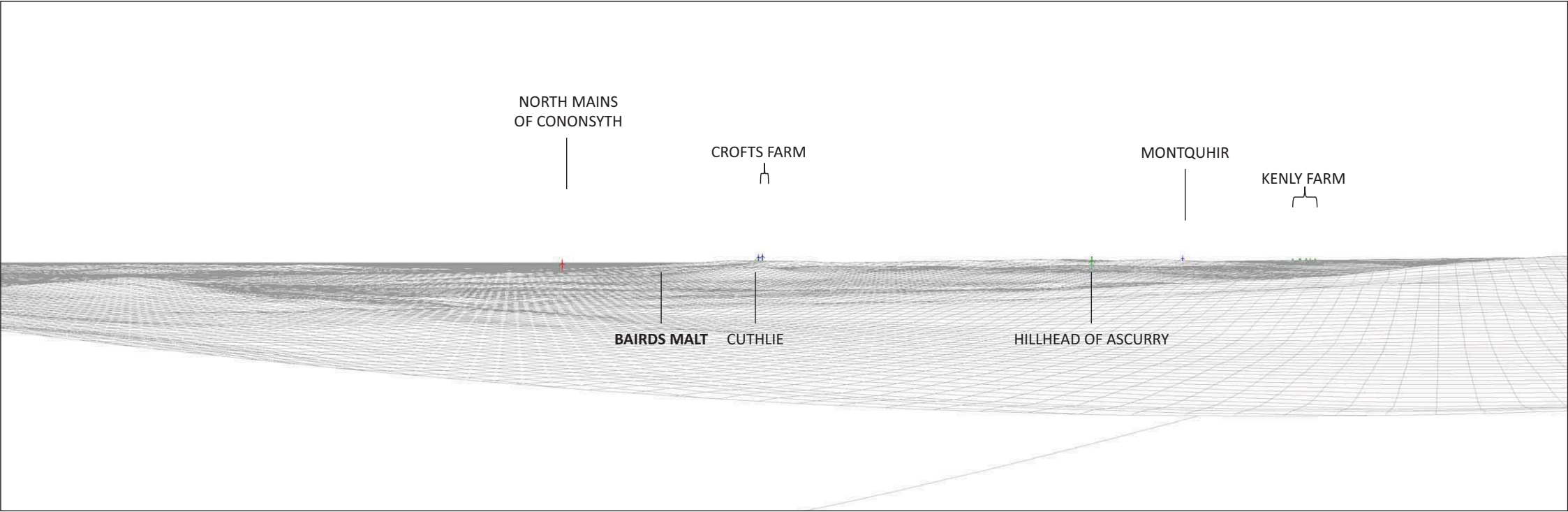
Document Number: **C0621-163/Fig 7.25**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**



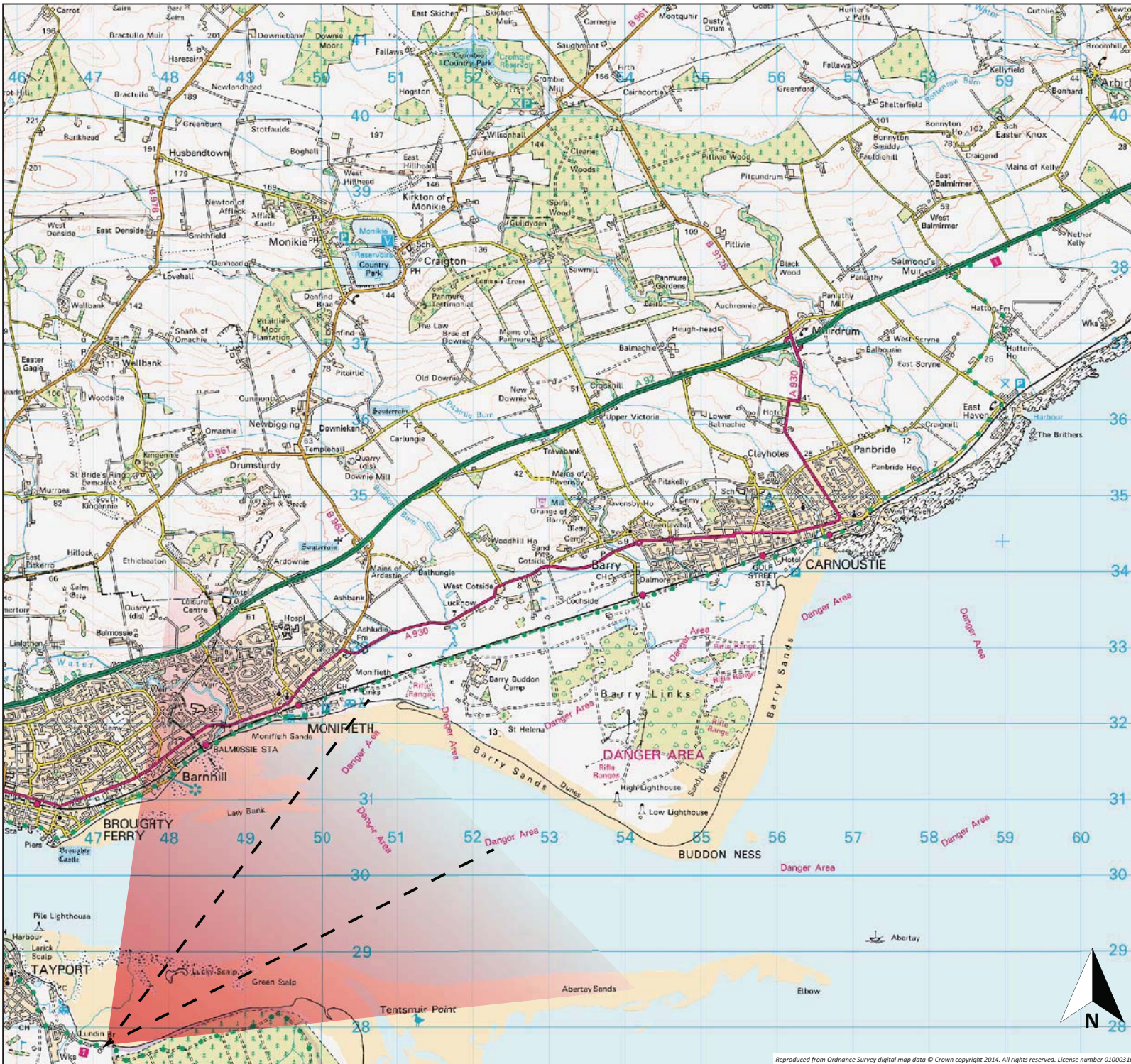




VP13 - WIRELINE DRAWING







Project Name: Bairds Malt Wind Turbine  
 Document Title: VP14 - Tentsmuir Recreational Area

Scale: 1:50,000 @ A3

- Key:
- Proposed Turbine Location
  - ◀ 76 and 26° Field of View

### Viewpoint Information

Viewpoint Location: E347170 N727786  
 Viewpoint Elevation: 1m (A.O.D)  
 View Direction: 37°  
 Distance to Turbine: 19.1km

Visibility: 5 Projects

Camera Type: Pentax K100D Super  
 Focal Length: 35mm  
 Effective Focal Length: 52mm  
 Date Taken: 29/10/2009  
 Time Taken: 14:53  
 Height above elevation: 1.5m

### Visual Impact

Magnitude: High  
 Sensitivity: Negligible  
 Overall: Moderate/Minor

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

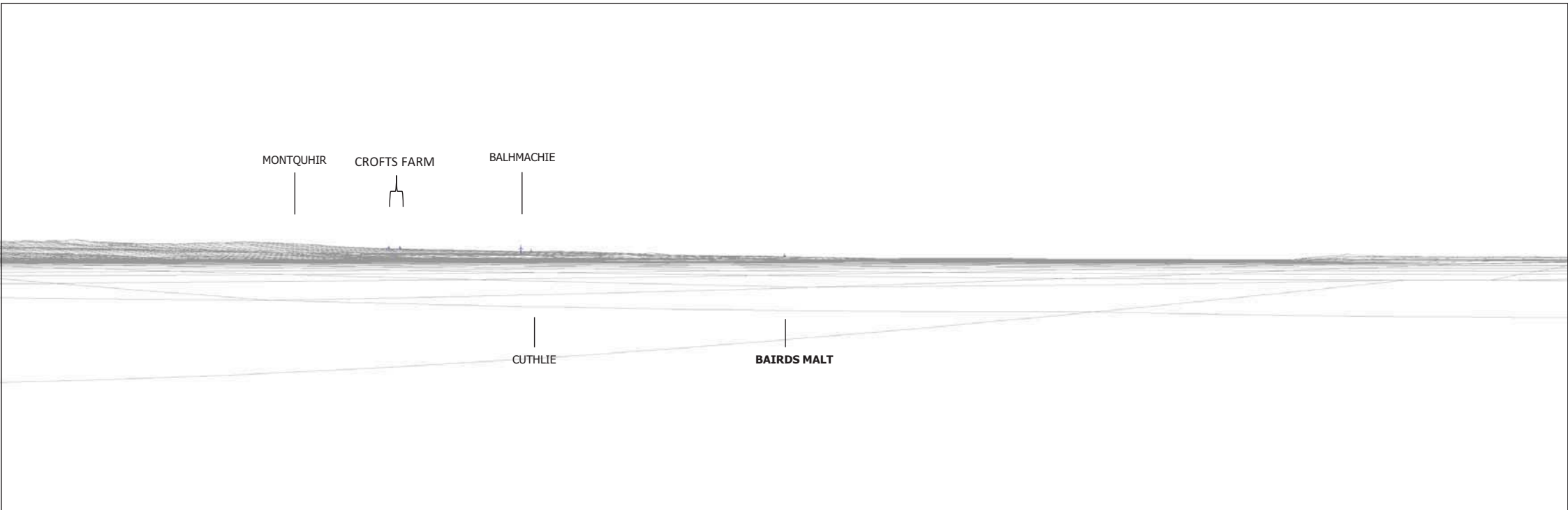
Document Number: C0621-163/Fig 7.26  
 Version: 1.0  
 Author: SS  
 Checked by: RC  
 Approved by: GM  
 Date: 17/12/2014







VP14 - WIRELINE DRAWING



VP14 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE

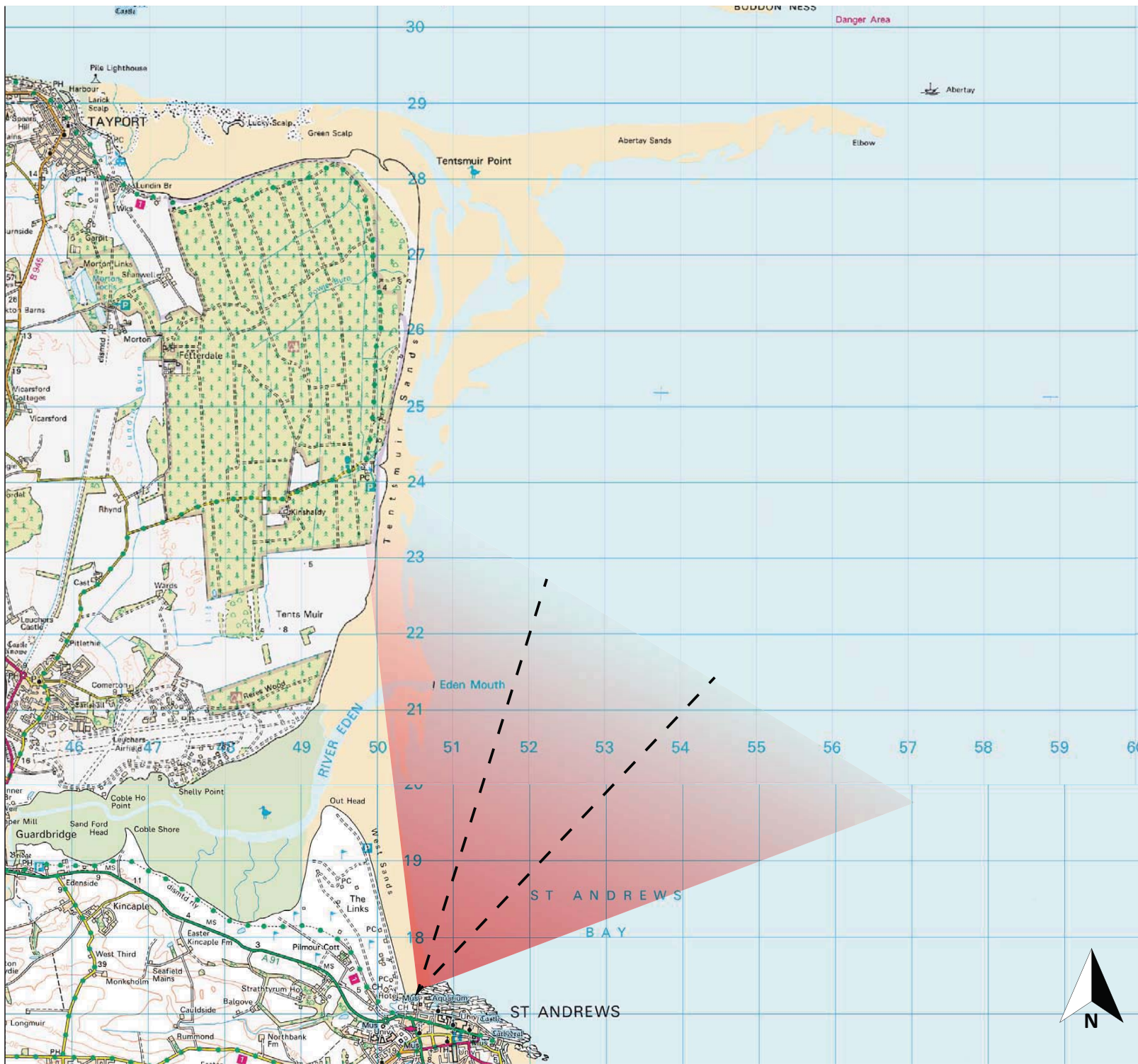


VP14 - 70MM PHOTOMONTAGE OF PROPOSAL




26° VIEWING ANGLE  
500MM VIEWING DISTANCE





Project Name: Bairds Malt Single Turbine Ltd  
 Document Title: VP15 - St Andrews  
 Scale: 1:50,000 @ A3

Key:  
 ● Proposed Turbine Location  
 76 and 26° Field of View

**Viewpoint Information**

Viewpoint Location: E350539 N717240  
 Viewpoint Elevation: 2m (A.O.D)  
 View Direction: 26.7°  
 Distance to Turbine: 25.5km

Visibility: 17 Projects


Camera Type: Pentax K100D Super  
 Focal Length: 35mm  
 Effective Focal Length: 52mm  
 Date Taken: 29/10/2009  
 Time Taken: 12:40  
 Height above elevation: 1.5m

**Visual Impact**

Magnitude: High  
 Sensitivity: Negligible  
 Overall: Moderate/Minor


*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd



Drawing by: Green Cat Renewables Ltd

Document Number: C0621-163/Fig 7.27  
 Version: 1.0  
 Author: SS  
 Checked by: RC  
 Approved By: GM  
 Date: 17/12/2014



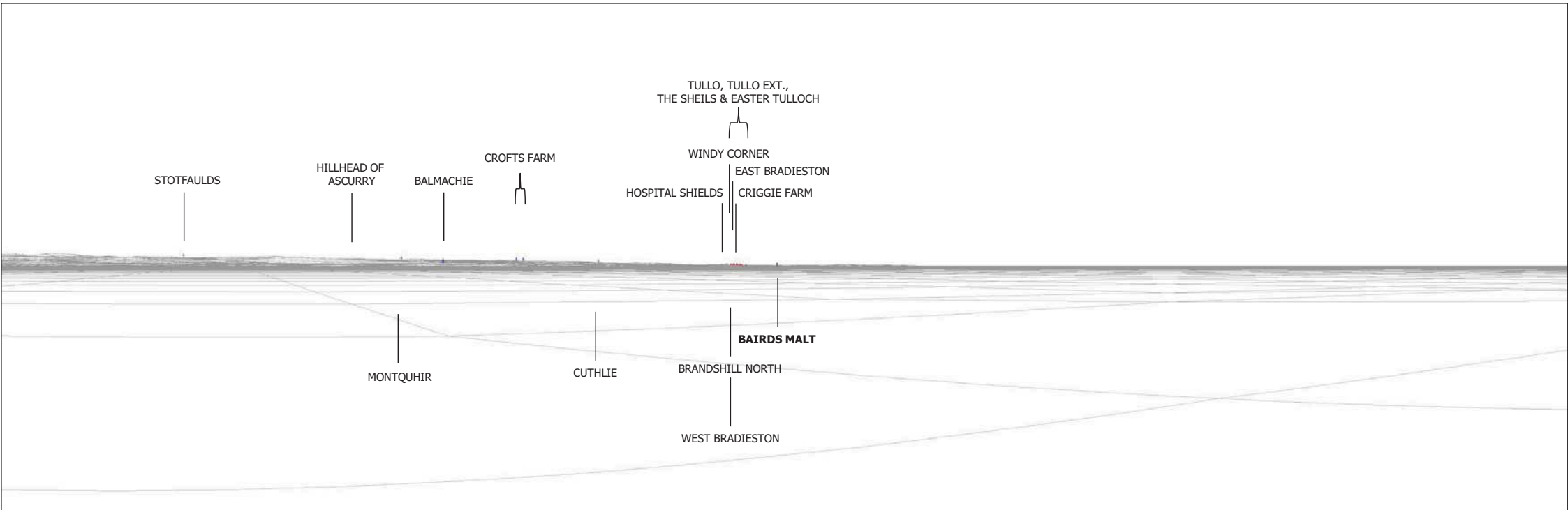
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VP15 - WIRELINE DRAWING



VP15 - PHOTOMONTAGE OF PROPOSAL

76° VIEWING ANGLE  
300MM VIEWING DISTANCE



VP15 - 70MM PHOTOMONTAGE OF PROPOSAL



26° VIEWING ANGLE  
500MM VIEWING DISTANCE



Project Name: Bairds Malt Single Turbine

Document Title: VP16 - White Caterthun

Scale: 1:50,000 @ A3

Key:



Proposed Turbine Locations



76° Field of View



5° Overlap

### Viewpoint Information

Viewpoint Location: **E354782 N766029**  
 Viewpoint Elevation: **292m (A.O.D)**  
 View Direction: **A. 354° B. 65° C. 136°  
 D. 207° E. 278°**  
 Distance to Turbine: **26.9km**

Visibility: **A. 0 Projects B. 18 Projects  
 C. 9 Projects D. 20 Projects  
 E. 2 Projects**

Camera Type: **Nikon D70s**  
 Focal Length: **35mm**  
 Effective Focal Length: **53.4 mm**  
 Date Taken: **15/07/2013**  
 Time Taken: **13:52**  
 Height above elevation: **1.5m**

### Visual Impact

Sensitivity: **High**  
 Magnitude: **Negligible**  
 Overall: **Moderate/Minor**

*Please note for a 76° field of view, a viewing distance of 300mm is recommended.*

Client: Bairds Malt Single Turbine Ltd

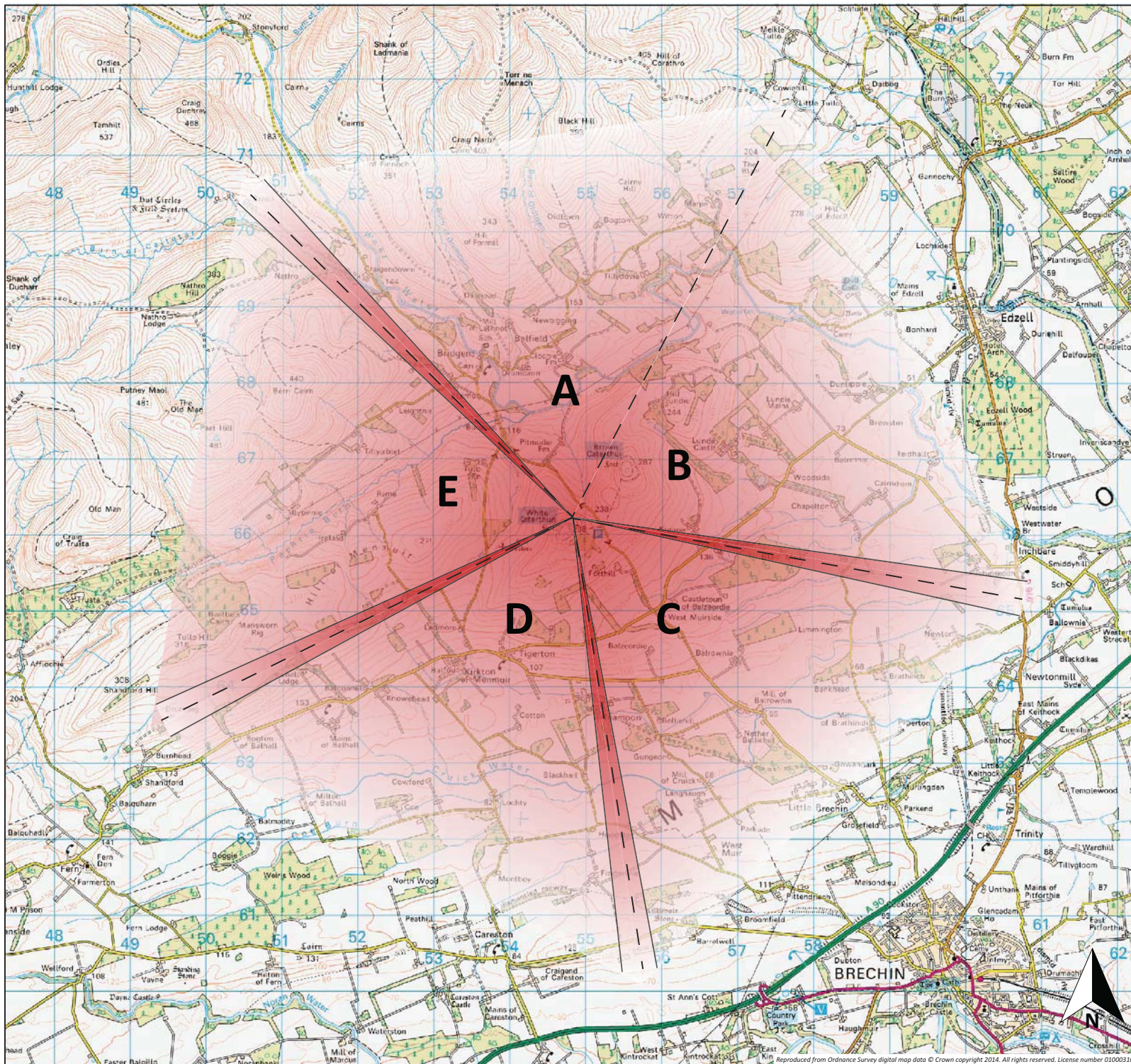


Drawing by: Green Cat Renewables Ltd

Document Number: **C0621-163/Fig 7.28**  
 Version: **1.0**  
 Author: **SS**  
 Checked by: **RC**  
 Approved By: **GM**  
 Date: **17/12/2014**



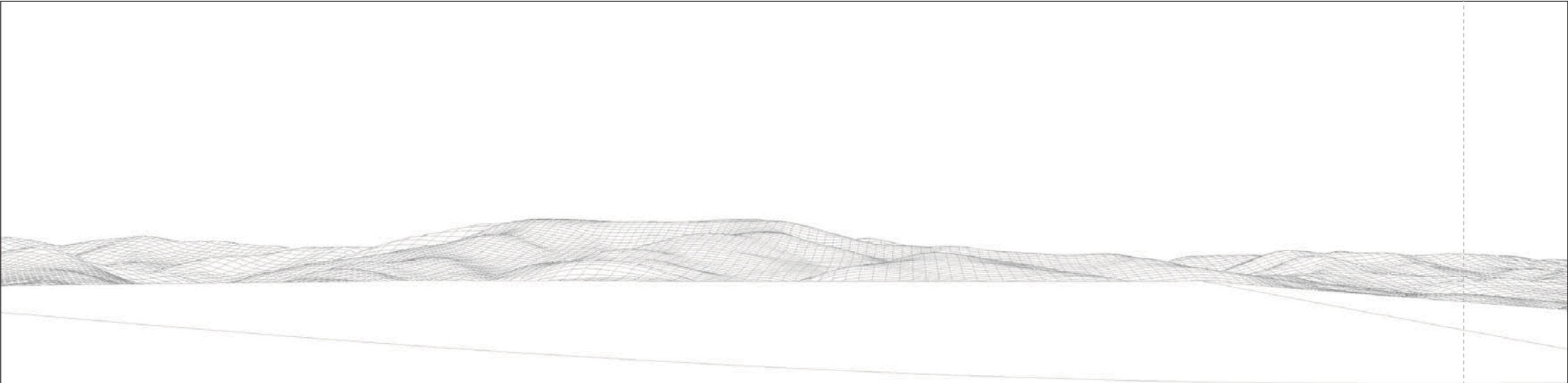
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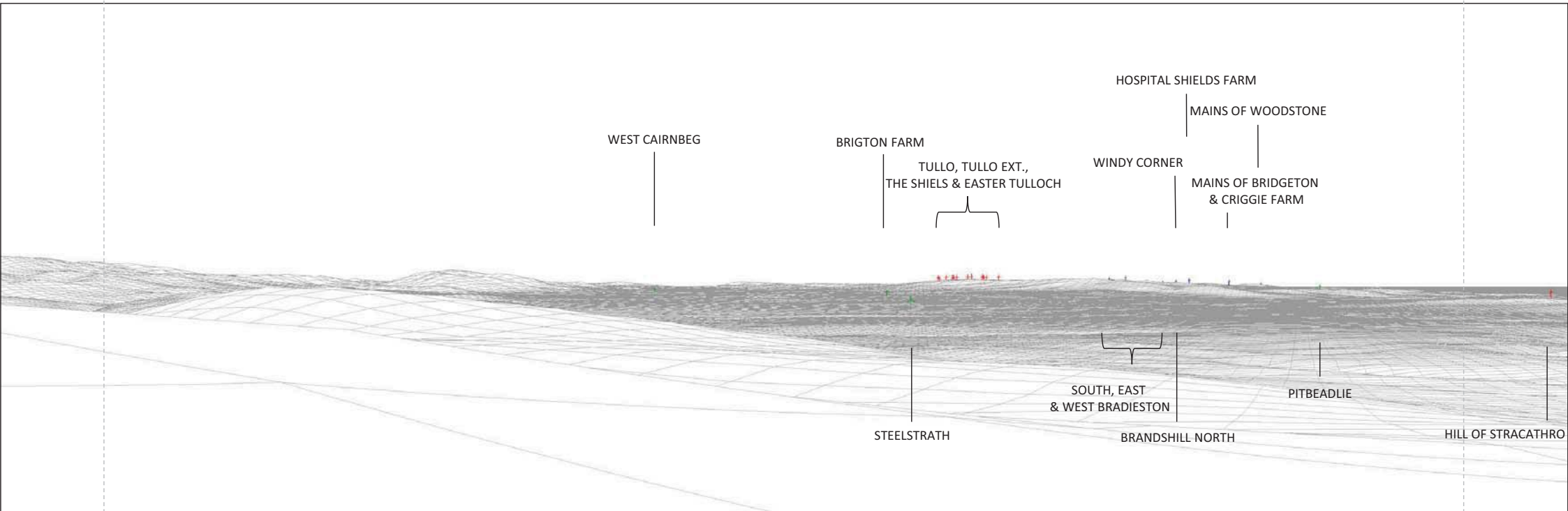


VP16A WHITE CATERTHUN - WIRELINE DRAWING





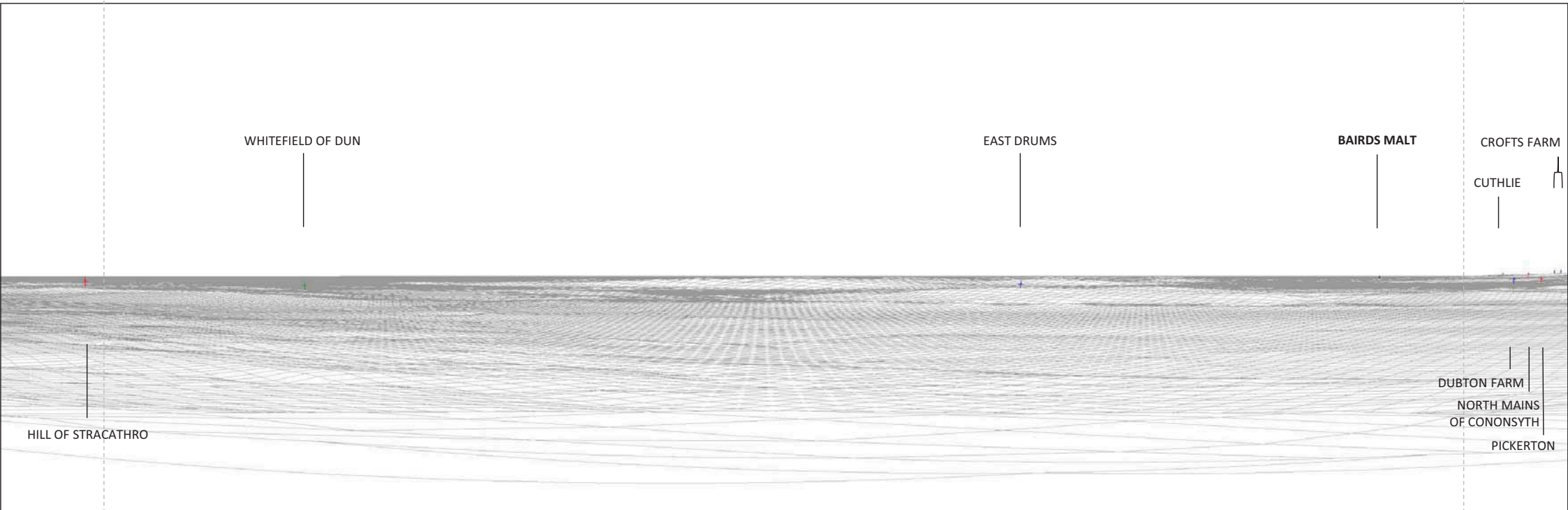
VP16B WHITE CATERTHUN - WIRELINE DRAWING





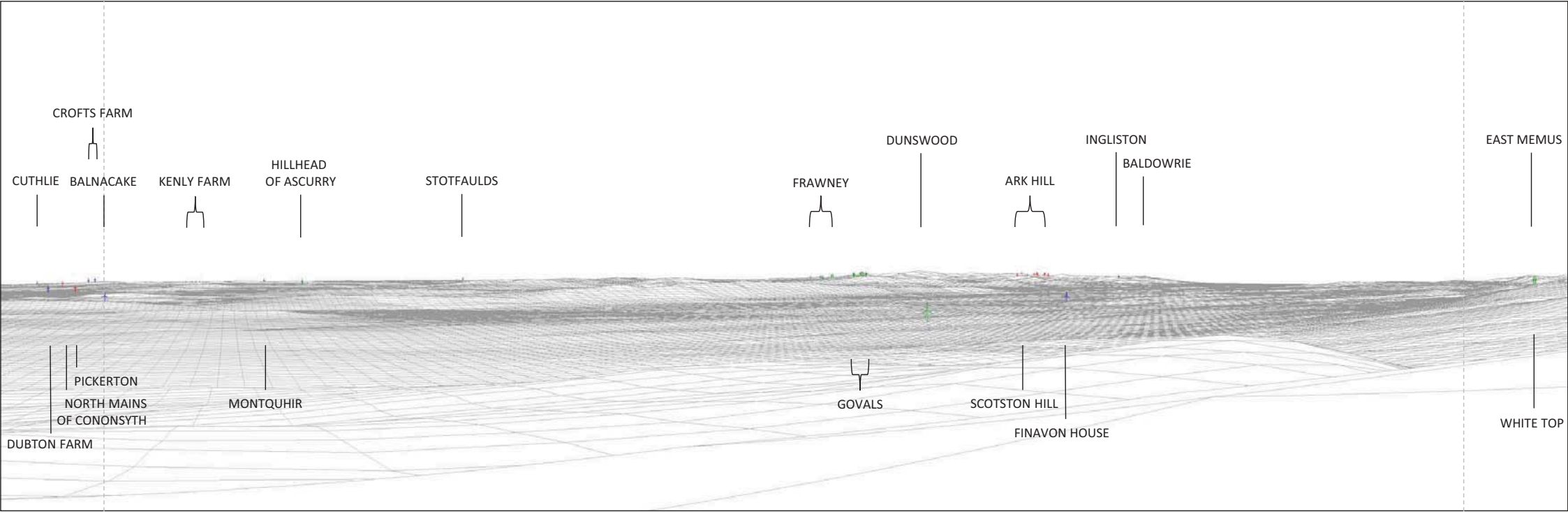


VP16C WHITE CATERTHUN - WIRELINE DRAWING





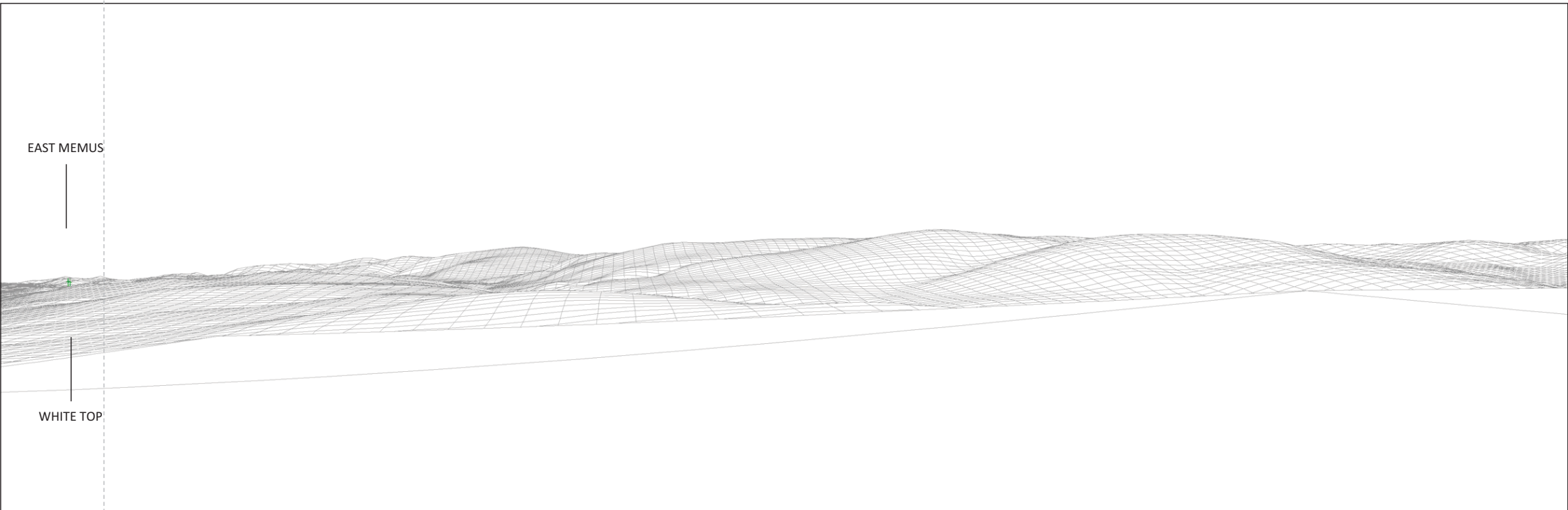
VP16D WHITE CATERTHUN - WIRELINE DRAWING







VP16E WHITE CATERTHUN - WIRELINE DRAWING



EAST MEMUS

WHITE TOP



**BAIRDS MALT WIND TURBINE**

**Response to Landscape Officer**

**Bairds Malt Single Turbine Ltd**

June 2015



Green Cat Renewables

## 1 Landscape and Visual Response

A planning application for a single wind turbine at Bairds Malt was submitted in January 2015 (REF: 14/01067/FULL).

This short note provides additional information in relation to response from the Council's Landscape Officer (dated 17th April 2015). The response raised concerns relating to the landscape and visual impact of the development.

This section sets out Green Cat Renewables (GCR) response to the comments received from the Council's Landscape Officer.

For convenience these are presented on a point-by-point basis in the following table.

Our Ref	Angus Council Countryside Officer - Points of Note	Response/ Action
<b>Landscape Effects</b>		
01	<i>The site is located in the Elliot Industrial Estate towards the western edge of Arbroath close to the division between Dipslope Farmland and Coast with Sand LCTs of the TLCA.</i>	<p>Agree. The turbine is located within the settlement boundary of Arbroath, and would closely associated with the existing industrial elements of the Maltings. An extension to the Peasiehill Industrial Estate into the fields to the west of Bairds Malt has received outline planning permission, which would extend the settlement boundary further.</p> <p>On a general note, the GCR believes that the response from the Landscape Officer does not give sufficient weight to the impact of the existing industrial elements already visible on site. The turbine will be viewed alongside other industrial elements within this section of the landscape, including the Maltings infrastructure, elements of which are over 30m in height. It would therefore not be viewed as an isolated industrialised feature in this area of the landscape.</p>
02	<i>The Dipslope Farmland LCT closest to Arbroath has lower capacity for turbines than other parts of the LCT.....Accordingly it is considered that there is no capacity in this area for turbines greater than 50m.</i>	<p>The proposed turbine is not located within the Dipslope Farmland LCT, as such any impact upon this area will be indirect. The turbine is located within the Development Boundary for Arbroath and as such does not have a capacity assigned within the capacity study. Page 46 of the Implementation Guide for Renewable Energy states:</p> <p><i>"Within Development Boundaries (as defined in the ALPR) it is not possible to define maximum turbine heights. Proposals for turbine development in towns and villages will be considered in the context of the ALPR policies and take account of the following considerations:</i></p> <ul style="list-style-type: none"> <li>• <i>Scale and location</i> – It is considered that the turbine is of a suitable scale for this location, providing a balance between energy generation and landscape &amp; visual impact. The ER demonstrates that the turbine is the smallest possible to provide sufficient clearance between the bottom of the blade sweep and the nearest Maltings buildings.</li> <li>• <i>Landscape setting</i> – The proposed development is sited within the footprint of the Maltings. This is an industrialised site, and the turbine would be viewed against industrial</li> </ul>

Our Ref	Angus Council Countryside Officer - Points of Note	Response/ Action
		<p>elements, which is in contrast to a turbine located on a greenfield site.</p> <ul style="list-style-type: none"> <li>• <i>Residential amenity including noise, shadow flicker, visual impact etc</i> – A full and robust assessment of these features has been carried out as part of the planning application. While there are some significant visual effects arising from the addition of the turbine, it is in keeping with the industrial operations at the site. Noise and shadow flicker results are presented elsewhere in the ER.</li> <li>• <i>Historic environment including townscape</i> – Again a townscape assessment has been carried out as part of the submission, impacts on Arbroath were considered to be minimal outwith the immediate surrounding areas, and these include the area of promenade to the east and the neighbouring housing estate. Historic Scotland has not raised an objection in terms of adverse impact upon the setting of any features within the study area, which including Arbroath Abbey, Keptie Hill Water Tower and the Hospitalfield complex.</li> <li>• <i>Compatibility with adjacent uses</i> – This is an industrial site with a high energy usage and the development has been brought forward as there is a demonstrable need for power on site. The two developments are therefore extremely compatible.</li> <li>• <i>Proximity to sensitive receptors such as educational buildings, open space and leisure facilities, hospitals, residential care homes, cemeteries, visitor facilities and accommodation and proposed development areas</i> - There are no prominent views of the development from local schools, hospitals etc. The only proposed development area in the vicinity of the site is the extension of the industrial area to the west.</li> <li>• <i>Access</i> – Not applicable in terms of LVIA, access would utilize current roads where possible.</li> <li>• <i>Design</i> – The ER sets out the design process followed. The turbine has been sited within the optimal location within the Maltings site.</li> <li>• <i>Security of equipment/facility</i> – Not applicable in terms of LVIA</li> <li>• <i>Ancillary works</i> – All ancillary works will be contained within the existing compound and will not have any visual impact.</li> </ul>
02	<p><i>Contrary to the opinions within the Environmental Report, it is considered that the proposed turbine would have significant impact upon the Coast with Sand LCT. This LCT has low capacity for turbine development, with only low capacity for turbines up to 30m in height.</i></p>	<p>The Coast with Sand LCT occurs in four distinct areas within the study area. The Environmental Report concedes that views from the nearest area of 'Coast with Sand' will be more prominent than those areas located to the south-east and north-east (which are at 7.5km and 11.7km distance).</p> <p>An overall magnitude of change was applied to the LCT as a whole, which considers the overall impact to be low. The nearest area of the LCT would experience a higher level of impact than those wider outlying areas. Within the ER, the views are likened to those within <b>Viewpoint 2</b>, which was</p>



Our Ref	Angus Council Countryside Officer - Points of Note	Response/ Action
		<p>assigned a high magnitude of change. The development is not located within the Coast with Sand LCT, and impacts would therefore be indirect, as opposed to direct. Views have been considered, and due to the built up nature around the waterfront, impacts were found to be limited to the eastern section of the LCT, immediately adjacent to the proposed turbine.</p>
03	<p><i>A turbine of the size proposed would become a landmark for this part of the Angus coast. It is therefore considered that the proposed turbine would have a significant effect upon the Coast with Sand LCT.</i></p>	<p>GCR would dispute whether the turbine would become a landmark for this part of the coast,</p> <p>Impacts on the A92, the settlement of Arbroath, neighbouring settlements and surrounding areas have been assessed and while there would be some localised significant impacts these were not found from the wider surrounding areas. If the turbine was to become a landmark feature, it would be expected to form a prominent landmark on the skyline from across the wider Angus area. The assessment does not support this summation.</p> <p>GCR notes that landmark features can be positive additions to the landscape. The Oxford English Dictionary defines a landmark as, “An object or feature of a landscape or town that is easily seen and recognized from a distance, especially one that enables someone to establish their location”.</p>
04	<p><i>Arbroath Abbey is an important part of the Arbroath skyline. It is not much taller than other buildings in Arbroath and is therefore vulnerable to being out-competed by taller structures. Similar issues apply to the Keptie Pond Water Tower. The size and prominent location of the proposed turbine on the edge of Arbroath would adversely affect the setting of Arbroath and historic landmarks within it.</i></p>	<p><b>Viewpoint 10</b> highlights the industrialised section of the landscape that the proposed turbine occupies and while it would be the most prominent vertical feature it is viewed against the sea and does not interfere with the sightlines across the settlement.</p> <p><b>Viewpoint 4</b> shows the turbine more in scale with the tallest features of the water tower and church spire. The Abbey is located to the north of the view, in a separate area, and there would be no interference from this location as the Abbey is not visible.</p> <p><b>Viewpoint 5</b> gives a view overlooking the settlement from the north, The turbine again sits separately to the water tower, with no visual confusion between the features. Indeed from this view the turbine is clearly visible with the Maltings buildings tying the industrial elements together.</p> <p>There are also no views predicted from within the Abbey and surrounds due to the screening features presented by the remaining walls and wider features. It is also noted that Historic Scotland raised no objection regarding the impact on the setting or character of the Abbey or the Keptie Water Tower, both of which fall within their remit.</p>
05	<p><i>The size of the turbine would be out of scale relative to smaller scale landscape features such as houses; trees and Kelly Den (see VP1, 2, 5, 8, 9, 10).</i></p>	<p>It is not considered that the turbine appears out of scale with the existing features from many of the views listed. Particularly <b>Viewpoints 1, 9 and 10</b> where it appears in keeping with scale of the existing features. The turbine from the wider areas appears in a separate section of the landscape to the wider settlement, and it does not interfere with the most prominent vertical elements in these views.</p>

Our Ref	Angus Council Countryside Officer - Points of Note	Response/ Action
<b>Visual Effects</b>		
06	<p><i>The location of the proposed turbine on the coastal plain notably influences the pattern and extent of visibility. Theoretical visibility extends is more extensive along the coastal plain south, south-west and north of the turbine.</i></p> <p><i>Hub visibility extends are far south as Fife Ness; as far south-west as Carnoustie and as far north as the higher ground west of Lunan Bay. To the west, visibility is generally restricted by higher ground around Carmyllie. As expected, blade tip visibility would be more extensive.</i></p>	<p>As discussed in Point 3. The turbine is located adjacent to the coastal plain, not within the coastal plain, however, the generally flatter topography of the surrounding area is highlighted by the ZTV which shows the theoretical visibility of the proposed turbine at both hub height and to blade tip. Visibility from the wider coastal areas is not considered to be overtly prominent with vegetation and other built features providing screening.</p> <p>The area shown by the ZTV describes theoretical visibility only, describing a bare earth scenario with no built features or vegetation. The Maltings themselves do not appear in views out with the local area, the highest point of the existing buildings reaching ~33m. With this in mind it is unlikely that a 77m tall structure will be an easily discernible feature from these areas as far south as Carnoustie and the other areas highlighted.</p>
07	<p><i>Much of the views of the proposed turbine would be along the open and relatively flat coastal plain; across the Firth of Tay or from higher ground. These factors together, lead to not only higher levels of visibility, but higher levels of prominence in views. This in part, contributes towards an overall lower underlying landscape capacity for wind turbine development on the coastal area. The size of the turbine together with the prominent location would inevitably lead to significant visual effects.</i></p>	<p>As per point 6. The theoretical visibility across the flat coastal plain is shown in the ZTV. Visual prominence of the turbine is quickly diminished beyond 5km. While views from the wider area, as evidenced in <b>Viewpoint 14 &amp; 15</b> show the turbine as a barely discernible feature from these wider views.</p> <p>Views from the areas around the A92 are predicted to occur for ~6km on the approach to Arbroath. This highlights the intervening screening features which limit visibility of the project from the wider areas, the assertion that there would be widespread significant visual effects in this case is not considered to be accurate.</p>
<b>Houses</b>		
08	<p><i>The closest affected houses are the 2 cottages at Peasiehill Farm Cottages to the north-west (326m/ 4 times turbine height). Given the size and proximity of the proposed turbine, I would agree with the ER that the houses would experience effects of major significance. At this proximity, the turbine is likely to be over-bearing and oppressive.</i></p>	<p>The Residential Assessment concedes that the turbine would be an obvious feature in the views from these neighbouring properties. It should also be noted that the view from these dwellings already contains the significant industrial development of the Maltings, and the more direct views to the east would be impacted by the consented extension to the Peasiehill Industrial Estate. The Peasiehill Cottages and Peasiehill Farm itself, are owned by a party with a financial interest in the turbine development.</p>
09	<p><i>There are further houses to the north-west at Peasiehill and Crudie (650m to 810m/ 8 to 11 times turbine height). The ER assesses the magnitude of effects as being medium. This is considered an under-assessment given the size of the turbine and its proximity. The turbine is likely to be a dominant feature in views from these houses and therefore would also create effects of major significance.</i></p>	<p>Similar to the cottages described above, although these properties are located slightly further away, the primary views are considered to encompass but not face primarily towards the Maltings buildings, hence the reason for a medium magnitude of change as opposed to high.</p>
10	<p><i>To the south the closest houses are 10 houses at Elliot Cottages (578m/ 7.5 times turbine height). (Appendix 2.3 VP1). The ER assesses the magnitude as high and significance major. I would concur. Impacts would further be increased by the elevated position of the turbine</i></p>	<p>Agreed. Where significant effects occur these are clearly presented within the ER. Although the properties are located in proximity to the coast, it is argued that the views to the rear are more enclosed than and not quite as picturesque as those to the front away from the turbine (although these views do also include the A92).</p>

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	<i>relative to the houses. The turbine would dominate the setting of the houses.</i>	
11	<i>To the north of the site, beyond the industrial estate, the closest houses within Arbroath are at Patrick Allan Fraser Street. This area is not included in the Residential Assessment, but Appendix 2.3 includes visualisations and a summary assessment. The closest houses are around 370m/ almost 5 times turbine height. Whilst there are intervening trees and buildings, Appendix 2.3 VP05 helpfully shows the proposed turbine typically protruding above these by around the rotor diameter (24m). Whilst, the Appendix assesses magnitude as high, it considers sensitivity as being low. Houses are typically high sensitivity, which would revise this assessment to major. Given the size and proximity of the turbine it is likely that the turbine would dominate houses and have an overbearing effect.</i>	<p>The sensitivity presented in the assessment table is incorrect, and this is a typing error. It is agreed that the sensitivity of this view would be high due to the local residents. Within the townscape assessment, the modern residential Estates, which cover more than one area, is considered to have a medium magnitude of change with an overall major/moderate level of effect.</p> <p>The closest receptors at Patrick Alan Fraser Street have been considered in significant detail throughout the application, as some of the key visual receptors. A number of site visits were undertaken, visiting individual properties following on from the public consultation meeting. As well as these visits, numerous photomontages were taken at locations throughout the estate to inform the assessment.</p> <p>The turbine has been described as prominent in views from the area, the assessment has not underplayed the potential impacts, however, it is considered that the turbine is in keeping with the scale of the local features, primarily the Maltings and is similar in type, being a vertical industrial feature.</p>
<b>Cumulative Landscape Effects</b>		
12	<i>Figure 7.14 of the ER lists nearby wind turbines either operational, consented or in planning. The closest turbine would be the consented 77m turbine at Cuthlie (4km). Overall there are a number of operational or approved turbines to the west and north-west or the proposed turbine. Together, they will create a wind turbine typology of "landscape with wind turbines". The current proposed turbine, in part due to its size, would extend this typology up to the edge of Arbroath. This would be beyond the underlying landscape capacity for this part of Angus. The proposal would therefore have significant adverse cumulative landscape effects.</i>	<p>The closest operating turbine is located over 8km inland at North Mains of Cononsyth. The Capacity study suggests a medium capacity for up to 50m turbines, however, as the ER notes the Bairds Turbine would be associated more closely with the industrialised Maltings buildings and at 77m does fit with the existing features. There was little in the way of cumulative impact found through the assessment, and as such the addition of the turbine at this location would not create a "landscape with wind turbines". It is considered that cumulative impact is not a significant issue in for this proposal.</p>
<b>Cumulative Visual Effects</b>		
13	<i>The paired ZTVs within the ER demonstrate that the proposed turbine would be likely to be commonly viewed "in combination", "in succession," and "in sequence" with other wind turbines. Again, the frequency of which such interactions occur would extend towards Arbroath and the coast, leading to significant cumulative visual effects.</i>	<p>This is certainly not the impression given within the ER, with only 9 of the 16 viewpoints having any cumulative impacts, where these do occur they have been considered in all but one viewpoint to be negligible. Cumulative impacts are not significant in relation to this application.</p>
<b>Conclusion</b>		
14	<i>Unfortunately, the proposed size of turbine close to the coast; Arbroath and a number of houses would lead to significant adverse landscape, visual and cumulative effects.</i>	<p>Impacts on the coast are not considered to be overbearing outwith a small section of the landscape within the adjacent area. The views considered from the wider area highlight the relative minimal impacts on the coastal areas. In general the views from the coastal areas are appreciated for their expansive uninterrupted views along the coastline and far-reaching views out to sea, none of which will be altered or affected by the addition of the Bairds Malt turbine.</p>

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		<p>The impacts on the settlement of Arbroath have been considered, and while some of the closest receptors, primarily local residents will experience some views in which the turbine will be a prominent feature, these views are tempered by the presence of the Maltings which already exists within these views. Wider views have been considered in the residential assessment, which highlights impacts on the closest visual receptors.</p> <p>There are no significant cumulative impacts arising from this proposal, the Environmental Report has not highlighted any areas of concern in regard to cumulative impacts.</p>

To conclude, whilst there are some significant impacts predicted with the construction and operation of a 77m tall wind turbine on the south-eastern edge of Arbroath, these impacts were found to be relatively localised. The turbine would be viewed alongside existing industrial elements and located within the existing footprint of the Maltings.

The impacts on Arbroath, residents, visitors and commuters has been assessed as part of a robust Landscape and Visual Impact Assessment. The findings of the LVIA show the turbine would add to the industrialised section of the landscape but would not become a dominant or overbearing feature across the wider countryside.

Similarly there were no significant cumulative impacts predicted from any of the selected viewpoints, chosen to represent the local and wider area. The turbine would be more closely associated with the industrial Maltings plant alongside features such as grain towers than any operating wind development within the local area.

We would ask that the Council carefully considers all of the above points alongside the wider benefits of the proposed scheme.