RWE

Clachaig Glen Wind Farm

Design Statement

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1. Introduction

1.1. Purpose of Design Statement

1.1.1 This Design Statement has been prepared by AECOM on behalf of RWE Renewables UK Onshore Wind Ltd (formerly known as E.ON Climate & Renewables UK Developments Ltd) (hereafter referred to as '**the Applicant**'). Its purpose is to support an application under Section 36 of the Electricity Act 1989, as amended ('**the Act**') for the proposed Clachaig Glen Wind Farm and Battery Storage Site ('**the Proposed Development**') which would have an installed capacity in excess of 50 megawatts (MW).

1.1.2 The Proposed Development is located approximately 20 kilometres (km) to the north of Campbeltown, 1.8km north east of the small hamlet of Muasdale and 3.7km south east of Tayinloan, in the administrative area of Argyll and Bute Council. The general site location (hereafter referred to as the '**Development Site'**) is shown on Figure 1.1: Site Boundary Plan (Environmental Impact Assessment Report (EIAR) Volume 2b).

1.1.3 The Design Statement is one of a wider suite of reports and documents submitted with the Section 36 application for the Proposed Development, as illustrated through Image 1-1.

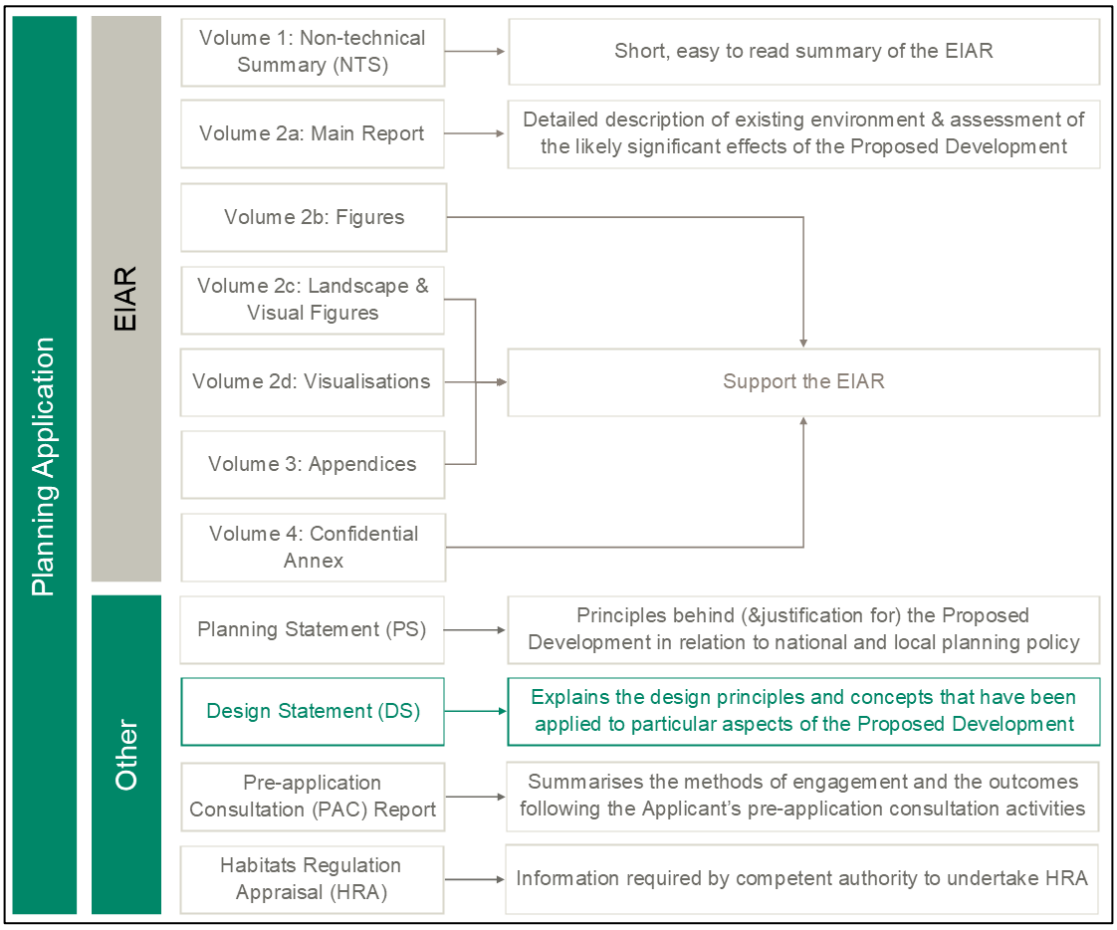


Image 1-1 Key Documents for Section 36 Application

1.1.4 The principles and concepts which have shaped the Proposed Development's location and design are detailed through this Design Statement. This includes: relevant national and local policies; physical, environmental and technical considerations; the appraisal methods for various stages of the design; and the consultation that has taken place throughout the design process.

1.1.5 It is not a requirement under the Act to produce a Design Statement for a Section 36 application, however it is useful in this case in order to detail the thorough design process that the Proposed Development has undergone over several years. It is additionally considered good practice to produce this Design Statement, as it is a requirement of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 ('**the Development Management Procedures Regulations**') for other categories of development (namely all National and Major Developments, as well as some sensitively sited Local Developments).

1.1.6 This statement only focuses on design and does not include reference to access. Section 13(5) of the Development Management Procedures Regulations requires access to be considered within a Design Statement; however, the focus of these requirements is on how access to the development for disabled people has been addressed. As the purpose of the Proposed Development is solely energy generation and storage, it has not been designed as an accessible destination for any visitor. Site access in general is addressed through Chapters 3 (Project Description) and 14 (Traffic, Transport and Access) of the EIAR (Volume 2a).

1.2. Structure of Statement

1.2.1 The approach to this Design Statement has been based on Circular 3/2013 Development Management Procedures, as amended (Scottish Government, 2015), as well as Planning Advice Note (PAN) 68: Design Statements (Scottish Executive, 2003).

1.2.2 This Design Statement will first report on the project background and the context of the Development Site (Section 2). It will then detail the national and local policies which have been influential on the location and design of the project (Section 3). The methodology of the evolution of the design will then be detailed (Section 4), before an overview of each of the key design stages which have led to the Proposed Development is presented (Section 5). The conclusion (Section 6) will then review the design process and focus on how mitigation has been incorporated into the design of the Proposed Development throughout this process.

2. Project and Site Context

2.1. Project Background

Consented Development

2.1.1 In December 2019, the Applicant gained approval under section 48 of the Town and Country Planning (Scotland) Act 1997 (as amended) for a 47.6 MW wind farm at the Development Site ('**the Consented Development**'). This was through appeal to Scottish Ministers (reference PPA-130-2064).

2.1.2 The Consented Development comprises 14 wind turbines: 13 with a blade tip height of up to 126.5 metres (m) (and hub height of up to 80m); one with a blade tip height of up to 115.5m (and hub height of up to 69m); and associated infrastructure (see Figure 1.2; EIAR Volume 2b).

Proposed Development

2.1.3 Due to the advancement of wind turbine technology, subsequent design modifications (to be detailed within this statement) and significant changes to the wider economics of onshore wind farms and other renewable technologies in Scotland, the Applicant is now submitting a new application under Section 36 of the Act to construct and operate a wind farm and battery storage facility with a generating capacity in excess of 50MW on the existing site of the Consented Development.

2.1.4 The Development Site boundaries for the Consented Development and the Proposed Development are almost identical, except for a section to the east of the site which has been excluded at the request of Forestry Land Scotland; the access track leading from the A83 to the main Development Site which has been widened to accommodate the delivery of larger turbine components, potentially utilising blade lifting technology; and a larger turning circle and turbine laydown area on the opposite (western) side of the A83 to the Development Site (see Figures 1.3 to 1.5 (EIAR Volume 2b)). Due to these changes, the Development Site has decreased in size from 12.59 km^2 to 12.47 km^2, with the exclusion of the area to the east being the reason for the smaller site size.

2.1.5 As with the Consented Development, the access track leading from the A83 to the main Development Site will be the sole access / egress from the site for construction, maintenance and decommissioning.

2.1.6 The Proposed Development comprises 12 wind turbines (two less than the Consented Development) and seeks an increased operational period of 35 years (the operational period is 25 years for the Consented Development). The Proposed Development additionally includes a battery storage facility with an expected upper capacity of 30 MW that was not part of the Consented Development.

2.1.7 Five of the turbines within the Proposed Development would have a maximum blade tip height of 200m, whilst the remaining seven would have a maximum tip height of 185m. All would have a maximum rotor diameter of 155m.

2.1.8 In order to provide consistency when discussing and comparing variations to the differing turbine layouts (i.e. Consented verses Proposed), the turbine numbering established for the Consented Development has been retained for the Proposed Development, with turbines T9 and T12 being the two turbines that have been removed.

2.2. Development Site Context

2.2.1 The Development Site is centred at National Grid Reference NR 172190 641550 and has an approximate area of 12.47 km^2 (1,247 hectares (ha). The A83 between Lochgilphead and Campbeltown (which passes through Muasdale on the western coast of the Kintyre peninsula) is located approximately 1km to the west of the Development Site. Access to the site will be taken from the Killean Estate junction with the A83, approximately 1km to the north of Muasdale, with the access following the existing Cross-Kintyre Timber Haul Route to the east, then to the south to the Development Site entrance using the existing forestry track (see Figures 1.4: Site Access leading to Main Development Site, and 1.5: Site Access and Turning Circle; EIAR Volume 2b). This is the same access as with the Consented Development. The access track between the A83 and the main Development Site is approximately 6km in length.

2.2.2 The majority of the Development Site is currently forested and managed by Forestry and Land Scotland (FLS) for timber production, with the exception of the higher land on the eastern boundary of the Development Site. The crop is in various stages of growth across the site with forestry operations currently ongoing.

2.2.3 The higher ground in the east of the Development Site includes some open ground that has not been planted. This is an area of high annual rainfall, as evidenced by the blanket peats and peaty topsoils which are apparent in undisturbed open ground areas. Flatter areas on the highest ground within the Development Site thus support relatively wet blanket peats, with associated mire vegetation. Forms of wet heath occur on the more steeply sloping valley sides, where peat would be expected to be shallower. The western part of the survey area includes a range of grasslands. These become progressively more productive and agriculturally improved towards the west of the area, where the ground is lower.

2.2.4 The southern part of the Development Site maintains height from the main eastern ridge, with a height in this southerly area of up to 250m Above Ordnance Datum (AOD). From this ridge the ground falls steeply to 140m AOD in a valley with a watercourse, Clachaig Water, before rising to approximately 240m AOD to the north west of the Development Site. Clachaig Water continues west out of the Development Site where it eventually meets the sea. The Development Site contains three small lochs in the east and south: Loch na Creige, Loch Mor and Dubh Loch. Loch na Naich is located outside of the Development Site to the immediate northeast.

2.2.5 There are a number of residential properties located within 3km of the Development Site, including several isolated properties located adjacent to the west of the A83 associated with the small settlements of Muasdale, Beacharr and Glenbarr. The nearest residential property to a proposed turbine location is High Clachaig, which is located approximately 1.2km west-southwest of the closest turbine (T14). It should be noted that under the Consented Development, the residential property of High Clachaig was located approximately 850m from the nearest turbine (Turbine T12); but as this turbine has now been removed in the Proposed Development, it has resulted in an increased distance between residential properties and turbine locations.

2.2.6 The Kintyre Way Long Distance Route follows the access track for the Proposed Development from the A83 until it is approximately 560m to the north of the Development Site, where the Kintyre Way then heads eastwards and the wind farm access heads south. At its closest point, the Kintyre Way passes approximately 230m from the north eastern point of the Development Site and 1km from the nearest turbine (T02).

3. Policy and Guidance Context

3.1. Policy Approach to Design

3.1.1 Circular 3/2013 Development Management Procedures, as amended (Scottish Government, 2015) states that a Design Statement should explain how any national or local policies relating to the design of a development have been taken into account.

3.1.2 National guidance, local authority design policies, supplementary guidance documents and design guides are also referenced as being an element of Design Statements in PAN 68 (Scottish Executive, 2003).

3.1.3 This section of the Design Statement therefore summarises how national and local policies relating to wind farm design have been taken into account. These are generally high-level documents which focus on the factors which may influence the siting of a wind farm within a landscape and the typical constraints which must be considered.

3.2. Scottish Planning Policy

3.2.1 The key national policy in regard to wind farm design is provided within Scottish Planning Policy, as revised (Scottish Government, 2014[1]). Paragraph 161 refers to the need for planning authorities to set out in their development plans a spatial framework identifying those areas that are likely to be most appropriate for onshore wind farms.

3.2.2 The approach to these spatial frameworks is set out in Table 3.1.

Table 3.1 Scottish Planning Policy Approach to Spatial Frameworks

Group	Description	Example
1	Areas where wind farms will not be acceptable.	• National Parks, • National Scenic Areas.
2	Areas of significant protection (where wind farms may be appropriate in some circumstances, however further consideration on potential significant effects will be required to protect the qualities of these areas).	• National and international designations, • Nationally important environmental interests, • Community separation for considering visual impact.
3	Areas with potential for wind farm development (where wind farms are likely to be acceptable subject to detailed assessment)	N/A

Source: Scottish Government (2014)

[1] Although updated in 2020, this updated version was quashed by judicial review (Graham's the Family Diary [2021] CSOH 74)

3.2.3 Section 3.3 of this Design Statement examines the spatial strategy adopted by Argyll and Bute.

3.2.4 Paragraph 169 of SPP provides a long list of other considerations to take into account in addition to a spatial framework. These potential constraints include:

- Net economic impact,
- Scale of contribution to renewable energy generation targets,
- Effect on greenhouse gas emissions,
- Cumulative impacts,
- Impact on communities and dwellings (visual impact, residential amenity, noise and shadow flicker),
- Landscape and visual impacts (including wild land),
- Effect on natural heritage (including birds),
- Impacts on carbon rich soils (using carbon calculator),
- Impact on public access (long distance walking and cycling routes, scenic routes),
- Impacts on the historic environment (scheduled monuments, listed buildings and their setting),
- Impacts on tourism and recreation,
- Impacts on aviation and defence interests and seismological recording,
- Impacts on telecommunications and broadcasting installations,
- Impacts on transportation (road traffic and adjacent trunk roads),
- Effects on hydrology (water environment and flood risk), and
- Opportunities for energy storage.

3.2.5 As will be shown in Sections 4 and 5 of this Design Statement, the considerations listed above have all been taken into account in the selection of the Development Site and the design of the Proposed Development.

3.3. Argyll and Bute Council

3.3.1 The Argyll and Bute Local Development Plan (LDP) was adopted in March 2015. Both Supplementary Guidance 1 and 2 to the LDP were adopted in 2016. Although Argyll and Bute Council are currently in the process of preparing their new Local Development Plan (LDP2), the 2015 LDP2 remains the primary local policy consideration until it is adopted in January 2023.

3.3.2 Policy LDP6 (Supporting the Sustainable Growth of Renewables) of the LDP states that it must be adequately demonstrated that there would be no unacceptable significant adverse effects on a number of considerations, which are similar to those mentioned in Scottish

Planning Policy as referenced in Paragraph 3.2.4 above. This demonstrates the importance of Environmental Impact Assessment (EIA) in helping to shape the design of a development, as has been the case throughout the design process of the Proposed Development (see especially Section 5 below).

3.3.3 Policy LDP6 additionally references the Council's spatial framework guidance which is contained within Supplementary Guidance 2: Wind Farm Map 1 and Map 2. These demonstrate that the Development Site is within Group 2 and 3 areas (see Table 3.1). It is partly within a Group 2 area due to the presence of deep peat. This was further considered through the Report to Scottish Ministers published by Scottish Government Reporters in their determination of the appeal for what is now the Consented Development (2019a). This report concluded that all parties agreed that the Consented Development addressed the requirements of deep peat and so there was no spatial reason why the Development Site could not be considered as if wholly within a Group 3 area.

3.3.4 The presence of deep peat within the Development Site has been subject to further site survey since the determination of the Consented Development (as referenced in Section 5 (Design Review 11: Proposed Development) of this Design Statement and detailed within Chapter 11 of the EIAR (Volume 2a) Geology, Hydrology and Hydrogeology). As a result, the design of the Proposed Development has been altered where possible to avoid deep peat when siting turbines and for the remaining infrastructure, although a small section of the road network does run through deeper peat areas (>2m) (see Figure 11.5: Peat Depth Interpolation (EIAR Volume 2b). Where deep peat is unavoidable, floating roads will be constructed to reduce effects (see Chapter 11; EIAR Volume 2a). In addition to this, the Applicant will provide for the restoration of peat within parts of the Development Site according to FLS (*unpublished*) updated Carradale Land Management Plan, as detailed in Chapters 9: Ecology and 17: Forestry (EIAR Volume 2a). The Proposed Development is therefore anticipated to be subject to normal considerations as if it were within a Group 3 area, as was the case for the Consented Development.

3.3.5 In the Report to Scottish Ministers (Scottish Government, 2019a) for the successful appeal of what is now the Consented Development, it was established that the 2017 Argyll and Bute Landscape Wind Energy Capacity Study is not part of the Council's spatial plan and is considered guidance only, rather than a zoning policy for wind farms within the region.

3.3.6 As established through the Report to Scottish Ministers, the focus of the design of the Proposed Development has therefore been on the landscape, visual and cumulative impact of the proposal "*on the ground*", alongside having regard to the recommended objectives of the 2017 Argyll and Bute Landscape Wind Energy Capacity Study. These objectives are to guard against unacceptable impacts on:

- Landscape designations,
- Arran and Gigha and surrounding seascapes, and
- Roads, recreation activity and settled coastal areas (Scottish Government, 2019a).

3.3.7 The continued assessment of landscape and visual impacts has therefore been key in the site selection process (see Viewshed Analysis below in Section 4.2), as well as in shaping every design change leading up to the Proposed Development. This has been achieved through the importance placed on input from AECOM's Landscape Team at every design discussion meeting, as well as the close working relationship established between the Landscape Team and Applicant. In addition, regular feedback has been sought from both Argyll and Bute Council and NatureScot. This is referenced through Section 5 of this Design Statement and detailed in Chapter 7 of the EIAR (Volume 2a) Landscape and Visual.

3.3.8 Whilst it is appreciated that landscape and visual impacts are often seen as subjective and will vary depending on personal opinion, which has resulted in not being able to satisfy every request from the consultation process with Argyll and Bute Council and NatureScot, the design of this development has very much been established through this continuous assessment by landscape professionals through the EIA process.

4. Evolution of Design Methodology

4.1. Forestry and Land Scotland (FLS) Background

4.1.1 To begin, in 2011 Forest Enterprise Scotland (FES) awarded the Applicant the exclusive rights to investigate the potential for new large-scale wind energy projects within part of the Scottish National Forest Estate in Argyll and Bute. In April 2019, FLS became the sole Scottish Government agency responsible for managing the National Forest Estate in Scotland, taking on the responsibilities of FES, as well as those of Forestry Commission Scotland and new responsibilities gained from the full devolution of forestry to Scotland. The rights to investigate the potential for wind energy projects within the Scottish National Forest Estate in Argyll and Bute have remained with the Applicant under FLS' management.

4.2. Site Selection

4.2.1 The initial wind farm site selection across the Scottish National Forest Estate in Argyll and Bute was partly aided through Viewshed Analysis (see Paragraphs 4.2.3 to 4.2.5 below) and considered a range of technical, environmental, planning and commercial factors, including:

- Availability of land,
- Wind regime,
- Site accessibility,
- Potential for electrical grid connection,
- Proximity to residential properties,
- Geology and ground conditions, and
- Environmental and planning constraints / designations.

4.2.2 The Development Site was identified as having the potential to support a viable wind farm development as it has good wind resource, good site access and is close to the existing electricity network.

Viewshed Analysis

4.2.3 Viewshed analysis was conducted through a Geographic Information System (GIS) based process developed by RWE which models a number of visual receptors in an area (such as residential properties, landscape designations, differing roads types, etc.). A level of importance is assigned to these visual receptors to ensure that the process emphasises the significance of one receptor over another. The RWE designed process then assesses, on a regional basis, the characterised environmental sensitivities to identify areas with the lowest potential visual impact for wind farm development within that region. This process is continually updated and developed to reflect environmental and policy changes.

4.2.4 It was used to first identify potential wind farm opportunities within Argyll and Bute, one of which was the Development Site. It was then used to further assess the impacts of the Development Site prior to Design Review 1. Following the granting of planning permission for the Consented Development, it was used again to review the best opportunities within Argyll and Bute for larger scale turbines and this fed into Design Review 9 (see Section 5). This repeat of the viewshed analysis was to ensure the Development Site remained the most appropriate location to operate a wind farm of this size and scale, which it concluded was the case.

4.2.5 This process has been shown to NatureScot and Argyll and Bute Council in discussions about the project. This was to emphasise the effort RWE have gone to in order to reduce the visual impacts of this wind farm proposal within the context of the Argyll and Bute Council region, as well as within NatureScot and the council's two preferred areas for wind farm development, LCT-6 and LCT-7, which coincidentally match to the preferred regions identified independently by the model. This highlights how the Development Site, in a regional context, offers one of the best locations in regard to minimising visual impacts on a regional basis, while developing a wind farm utilising turbines of the scale of this Proposed Development.

4.2.6 Figure 1 (Design Statement) shows the output of the viewshed analysis for turbines within the Development Site with a hub height of 125m (the turbines of the Proposed Development have a maximum hub height of either 112m (seven turbines) or 132m (five turbines)). The viewshed analysis shown in Figure 1 also includes those regions where there are wind farms already consented or built in LCT-6. Given the proprietary commercial nature of this data, it has been limited to showing only the areas 300m from a given turbine location. The plan shows a heat map representation of the sensitivity, based on RWE's model. This clearly illustrates that the turbines are located in a less sensitive location in terms of visibility, than most others already consented and built in the region. Note, the full model results have been shown in confidence to NatureScot and Argyll and Bute Council when discussing the Proposed Development to show how RWE have looked to minimise visual impacts from their proposal.

4.3. Design of Proposed Development

4.3.1 The design of the Proposed Development has been advanced in parallel with the EIA, as more information has become available on environmental and design constraints and in response to issues raised during the EIA and public consultations.

4.3.2 The design evolution of the Proposed Development has continued the process adopted for the Consented Development and has taken full account of the physical, environmental and technical constraints of the Development Site, balancing the need for energy generation yield with environmental impacts. To achieve this, the physical, technical and environmental characteristics of the Development Site have been identified through a combination of baseline studies and consultation with statutory and non-statutory consultees.

4.3.3 The remainder of this chapter explores this design evolution process, considering constraints mapping exercises (Chapter 4.4) and consultation and engagement (Chapter 4.5).

4.4. Constraints Mapping

4.4.1 Constraints mapping using GIS was implemented throughout the design process for the Proposed Development in order to determine the developable area, the design of the turbine array and the associated infrastructure within the Development Site (see Figure 2, Design Statement).

4.4.2 In order to conduct this constraints mapping, physical and environmental constraints on the Proposed Development (both on-site and off-site) were identified by means of detailed desk study, consultation and fieldwork. The constraints considered included (but were not limited to):

- Wind yield,
- Topography,
- Ground conditions,
- Dwellings,
- Utilities,
- Overhead power lines and overhead cables,
- Telecommunications links,
- Roads,
- Footpaths and cycle paths,
- Watercourses,
- Archaeological features,
- Environmental designations,
- Woodlands,
- Potential for landscape and visual impacts by using a zone of theoretical visibility (ZTV),
- Viewshed assessment, and
- Ecological and ornithological species / habitat.

4.5. Consultation and Engagement

4.5.1 A comprehensive and multi-stage pre-application consultation programme was undertaken to inform the design of the Proposed Development, from the initial project conception, throughout the EIA process, to the present finalised design. This consultation was undertaken with a range of interested parties, including statutory and non-statutory consultees, stakeholders and the local community.

4.5.2 Key consultation responses and engagement events are referenced in Section 5 of this Design Statement where they have been particularly influential to the design evolution of the Proposed Development.

Community Engagement Programme

4.5.3 The Pre-application Consultation Report, which is one of the documents accompanying this Section 36 application (see Image 1-1), provides detail on the community engagement programme conducted throughout the design process since Design Review 1. Public Information Days, Community Liaison Group meetings and Public Exhibitions (including a month-long virtual exhibition in 2021) have all influenced the design up to the Proposed Development.

4.5.4 This engagement and the associated Pre-application Consultation Report are not requirements of a Section 36 Application; however, the Applicant places an importance and value on community engagement in the design evolution of a development, and the Pre-application Consultation Report is an effective means in which to detail this voluntary engagement programme.

Statutory and Non-statutory Consultees

4.5.5 The EIAR provides detail on the consultation conducted with statutory and non-statutory consultees which has influenced the design of the Proposed Development, as well as the focus of the EIA.

4.5.6 Chapter 5 of the EIAR (Volume 2a): Summary of Consultation, details the EIA Scoping consultation and later Energy Consents Unit (ECU) Gate Check which provided a formal means to consult with a variety of organisations. The responses to these consultation exercises are also provided within Chapter 5 of the EIAR.

4.5.7 Further consultation with stakeholders has also taken place outside of EIA Scoping and the ECU Gate Check. Key consultation to the design evolution of the development is referenced below in Section 5. Additionally, the technical chapters of the EIAR (Chapters 7 to 18; Volume 2a) reference the consultation relevant to that specialism.

Forestry and Land Scotland

4.5.8 The Applicant has worked closely with FLS during the design stages of the Proposed Development and FLS' development of the updated Carradale Land Management Plan (*unpublished*) to ensure they correlate. The Land Management Plan sets out phased felling plans for a wider area which includes the Development Site until 2054.

4.5.9 The result of this partnership is that the Proposed Development fits well within the updated Carradale Land Management Plan. The Applicant is also able to contribute to FLS' planned peatland restoration within the Development Site as part of habitat enhancement measures.

4.5.10 This has been the first time FLS has worked with a developer in this manner and, due to its success, FLS hope to use it as a blueprint going forward for future development within their estate.

5. Design Review Stages

5.1. Design Review Stages

5.1.1 The layout of the Proposed Development has gone through a series of design iterations, from the original layout of 53 turbines, to the Consented Development of 14 turbines, and then finally to the Proposed Development of 12 larger turbines. An overview of the key Design Review Stages is illustrated within Image 5-1 and each stage is also detailed below.

5.1.2 The wind farm design associated with each stage is shown through Figures 3 to 5 (Design Statement).

Design Review 1 (Leading to Consented Development)

5.1.3 An initial turbine layout was prepared in 2013 comprising 53 turbines, each with a maximum tip height of 126.5m (see Figure 3, Design Statement). This turbine layout was a maximum layout within the FLS land ownership boundary and considered all initial known environmental constraints, including watercourses, topography, dwellings and the Kintyre Way Long Distance Route.

5.1.4 This initial layout was used to inform various consultations with statutory consultees, the Community Liaison Group (CLG) and the general public as part of the following:

- Public Information Days (5 and 6 June 2013), and
- The initial EIA Scoping Report linked to the Consented Development (submitted on 7 June 2013).

5.1.5 In response to these consultations, further studies were undertaken as part of the EIA process with regard to landscape and visual effects and other potentially sensitive sites. A more detailed EIA constraints mapping exercise was also undertaken.

Design Review 2 (Leading to Consented Development)

5.1.6 To take account of updated land option agreements and to include land for a potential access track direct to the A83 as advised by Argyll and Bute Council, the Development Site boundary was then expanded to include two additional parcels of land to the north and west of the previous Development Site.

5.1.7 As a result, a revised maximum layout comprising 58 turbines was set out (see Figure 3, Design Statement). The maximum tip height of 126.5m was maintained for each turbine.

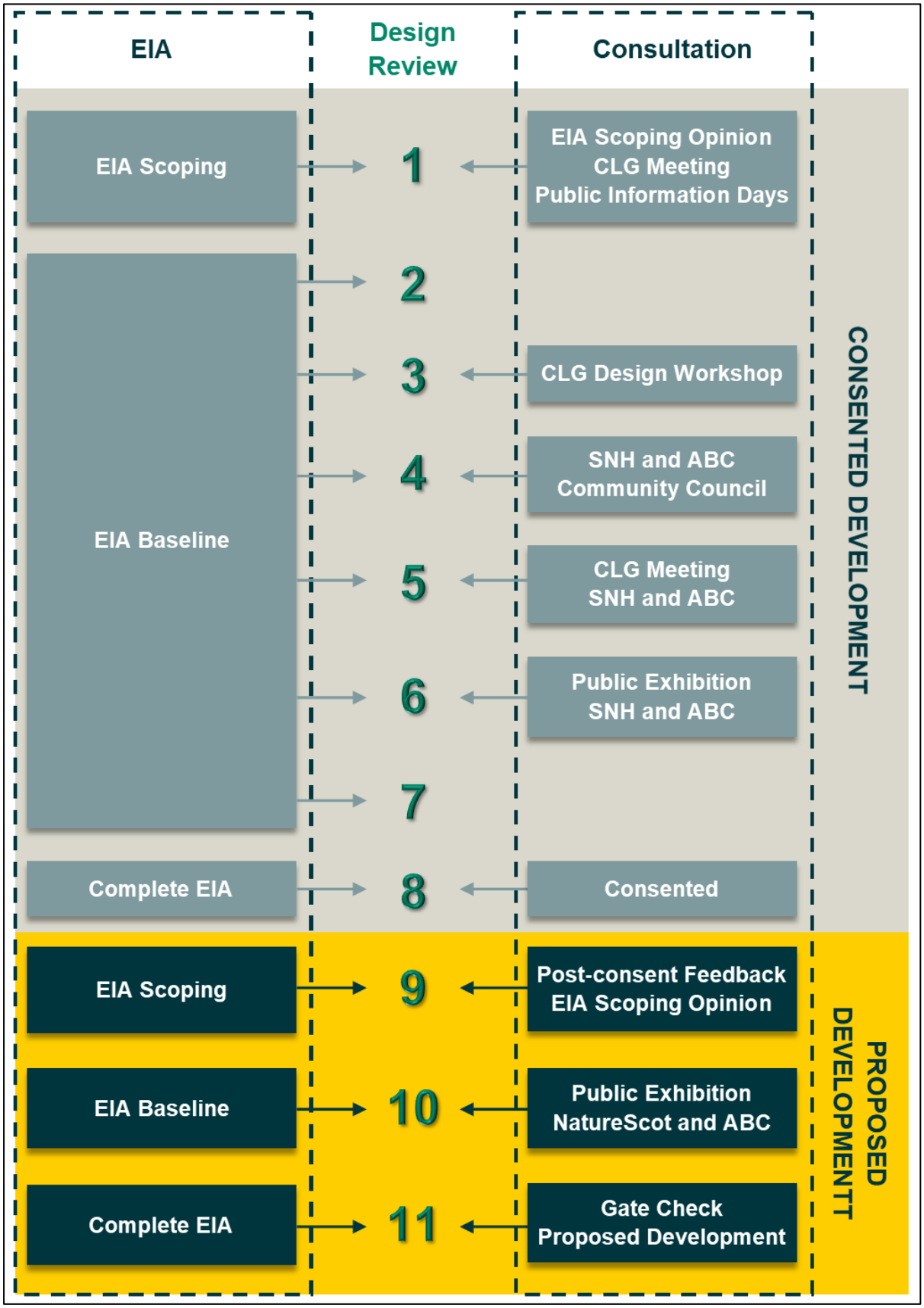


Image 5-1 Design Review Stages[2]

Design Review 3 (Leading to Consented Development)

5.1.8 In April 2014, a third design review was undertaken. The revised design took into consideration a 'high risk ornithology constraint' identified at the eastern end of the Development Site, which had been identified through ongoing ornithological surveys. The ridge area to the east of the site was considered high sensitivity due to hen harrier and red-throated diver activity. To avoid the potential for ornithological effects, the turbine array was amended within the remaining site, and the maximum number of turbines reduced to 50 (see Figure 3, Design Statement).

5.1.9 The Design Review 3 layout was presented for consultation with local residents and stakeholders at the CLG Design Workshops held at Glenbarr and Gigha Village Halls in May 2014.

Design Review 4 (Leading to Consented Development)

5.1.10 Following feedback from the CLG Design Workshops in May 2014, the turbines to the west of the Development Site were removed, as concerns were raised by the community regarding the potential for visual impacts on local residents to the west of the site, the A83 and the Area of Panoramic Quality. Therefore a 'less preferred area identified by residents and for reasons of landscape protection' was added to the constraints plan (Figure 2, Design Statement).

5.1.11 In response to this feedback, a revised turbine layout of 43 turbines (shown in Figure 3, Design Statement) was developed. Turbines were removed from the western part of the site, which resulted in reducing much of the visibility of the wind farm from the coastline. The maximum tip height of 126.5m was maintained for each turbine.

5.1.12 The Design Review 4 layout was presented at the Community Council meeting in October 2014 and was discussed at a meeting with Scottish Natural Heritage (SNH; now NatureScot) and Argyll and Bute Council in the same month.

Design Review 5 (Leading to Consented Development)

5.1.13 The October 2014 meeting with SNH and Argyll and Bute Council raised concerns from both parties over the visibility of the proposed turbines from the A'Chleit / Muasdale, in particular the raised beach area and views from the A83.

5.1.14 An initial assessment of landscape and visual impacts from the raised beach and other sensitive areas (including the A83) was undertaken. Turbines that were identified as highly visible from these viewpoints were identified and the 'less preferred area identified by residents and for reasons of landscape protection' was expanded within the GIS mapping.

5.1.15 This 'less preferred area identified by residents and for reasons of landscape protection'' was later extended again to take into account consultation responses on landscape and visual effects from local residents. Turbines originally located within the defined 'less preferred area

[2] Environmental Impact Assessment (EIA); Community Liaison Group (CLG); Scottish Natural Heritage (SNH), now NatureScot; Argyll and Bute Council (ABC)

identified by residents and for reasons of landscape protection' were then repositioned outside these areas so as to avoid these areas of greater visual prominence.

5.1.16 As a result of ongoing ornithological surveys, further constraints were identified to the south of the site due to the presence of red-throated divers and Greenland white-fronted geese, which were deemed a 'high risk ornithology constraint' (Figure 2, Design Statement). This new ornithological exclusion zone overlapped the 'less preferred area identified by residents and for reasons of landscape protection'.'

5.1.17 Furthermore, during an internal design workshop between the landscape architect and the Applicant's wind yield team, the Applicant's wind yield team identified parts of the site that were unsuitable in terms of turbine efficiency for development.

5.1.18 At this time, for technical reasons turbine hub heights were lowered to 76m and the maximum blade length was increased to 49m. This followed earlier work undertaken on the preferred route to development, which had compared a Siemens SWT-2.3-93 turbine with a 45m blade length to a Siemens SWT-3.0-101 turbine with a 49m blade length. It was identified that there were no additional potential risks in achieving access into the site for the 49m blade transporter.

5.1.19 As a result, the spacing between the proposed turbines increased, resulting in a 22-turbine layout (shown in Figure 4, Design Statement). The maximum tip height of 126.5m was maintained for each turbine.

5.1.20 The Design Review 5 layout was presented at the CLG meeting in May 2015.

Design Review 6 (Leading to Consented Development)

5.1.21 Further design work was then undertaken to refine the initial objectives and to pick up on the design points brought forward by SNH and Argyll and Bute Council in October 2014 which had not been addressed within the changes made to Design Review 5. The key objectives for this further design work were to: reduce the horizontal spread particularly when viewed from the west; limit turbines in view from the Kintyre Way and from the A83 and coastal fringe; rationalise the turbines in view from North Muasdale by limiting stacking and overlap; and creating a simpler layout.

5.1.22 After considering the objectives detailed above, seven turbines were removed from the previous layout, resulting in a revised 15-turbine layout (shown in Figure 4, Design Statement). The maximum tip height, blade length and hub height were maintained for the remaining turbines.

5.1.23 The 15-turbine layout was presented at a Public Exhibition in September 2015 and additional consultation with SNH and Argyll and Bute Council was undertaken in October 2015.

Design Review 7 (Leading to Consented Development)

5.1.24 Following the Public Exhibition and additional consultation with SNH and Argyll and Bute Council, a further internal design workshop was held in December 2015 between the

landscape architect and the Applicant's wind yield team. The layout was further refined to optimise wind yield (namely to improve turbine efficiency) and to reduce visibility. This led to a 14-turbine layout (Figure 4, Design Statement).

5.1.25 During this process, it was decided that the hub height of Turbine 1 would be reduced to 69m, with the resulting maximum tip height for Turbine 1 being 115.5m. The height of the other turbines remained unchanged.

Design Review 8: The Consented Development

5.1.26 Following Design Review 7, work commenced on the design of the infrastructure on site (access tracks, turbine crane pads, substation, temporary quarry ('borrow pit') locations and proposed location of the permanent met mast). As part of Design Review 8, the proposed access to the Development Site was added to the layout plan.

5.1.27 In developing the infrastructure layout for the Consented Development, use was made where possible of the existing access track to minimise disturbance of land. The layout was also influenced by ground conditions and topography. New access tracks were routed in order to avoid, as much as possible, areas of deeper peat. Potential effects on watercourses were reduced by minimising the number of crossings required.

5.1.28 An application for planning permission to Argyll and Bute Council was made in 2016 (reference 16/01313/PP), and in December 2019 the Applicant gained consent for the 47.6MW wind farm through appeal (reference PPA-130-2064) as established through Design Review 8 (the 'Consented Development'). This comprised 14 wind turbines (13 with a blade tip height of up to 126.5m (and hub height of up to 80m), one wind turbine with a blade tip height of up to 115.5m (and hub height of up to 69m) and associated infrastructure (see Figure 4, Design Statement).

Design Review 9: The 2020 Scoping Opinion

5.1.29 The Development Site's potential was reanalysed following the granting of planning permission for the Consented Development, to make best possible use of the wind resource on site. This optimisation of the Development Site accords with the Scottish Government's Global Climate Emergency declaration (2019b), where a call was made for transformative changes to be made across the board in order for Scotland to meet its 2045 target for net zero emissions. In addition to this, the wind industry, and in particular the technology, has evolved considerably since the original application was made in 2016 and has resulted in the use of taller, more efficient turbines across many wind farm sites in order to increase power output, allow a quicker move towards net zero emissions targets, and reduce the cost to consumers, as more efficient sites reduce or avoid the need for subsidies.

5.1.30 It was not only the Development Site which was reviewed through this process, as a landscape and visual viewshed analysis was conducted by the Applicant for the whole of the Kintyre Peninsula and Argyll for potential sites that can accommodate larger turbines (see Section 4.2). The review established the Development Site as one of the best opportunities

in the region to minimise visual impacts when using larger turbines, as had also been the case for the original viewshed analysis of the Kintyre Peninsula and Argyll in 2012.

5.1.31 These changing market conditions and the assessments of Development Site capability and the regional viewshed led the Applicant to alter the design of the Consented Development, reducing the number of turbines from 14 to 12 in order to maintain efficiency through larger spacing between turbines, and increasing the blade tip height to a range between 185m and 200m (155m rotor diameter), with much of the proposed infrastructure and site layout remaining similar to the Consented Development (see Figure 5, Design Statement). Battery storage facilities were also added to the proposal for the first time in order to further maximise the efficiency of the wind farm. Additionally, the operational period being sought has increased from 25 to 35 years which has become common in the wind energy industry in recent years due to improvements in turbine technology.

5.1.32 The request for a Scoping Opinion was then submitted to the Scottish Minister's Energy Consents Unit (ECU) in July 2020 (reference ECU00002103). The development layout of Design Review 9 is illustrated within Figure 5, Design Statement).

Design Review 10: The Public Exhibition Layout

5.1.33 The ECU issued a Scoping Opinion in October 2020, which contained feedback from a number of statutory consultees that was used to continue developing the design of the Proposed Development.

5.1.34 In tandem to the EIA, a detailed wind yield assessment was conducted on the Development Site using the information gathered through the one anemometer currently deployed on the site and data from the historical three masts there previously. The results of this wind yield assessment formed the basis of a design meeting between the Applicant and EIA team in December 2020, which following feedback in particular from the ecology; ornithology; geology, hydrology and hydrogeology; and landscape and visual teams, resulted in further changes to the wind farm layout and turbine size.

5.1.35 The blade tip height was increased to 185m (150m rotor diameter) and the location of many of the turbines was altered to optimise the power efficiency of the site.

5.1.36 This layout (see Figure 5, Design Statement) was presented for the online public exhibition event which took place between 29 January and 28 February 2021, with a live chat forum on 24 February. Consultation was also undertaken with NatureScot in March and a meeting held with Argyll and Bute Council on 2 March 2021. Due to a significant cyber-attack rendering some of their core systems unavailable in December 2020 which remains an ongoing issue, it was not possible to consult with the Scottish Environment Protection Agency (SEPA).

Design Review 11: Proposed Development

5.1.37 The feedback from NatureScot and Argyll and Bute Council led to the Applicant reviewing their comments and concerns in detail, and subsequently delaying the project whilst further

wind yield assessment was undertaken in discussions with potential turbine manufacturers over specific turbine locations and their technical constraints.

5.1.38 The Applicant also worked closely with AECOM's Landscape Team to assess the proposal in order to ensure that the layout selected balanced economics, its contribution to renewable energy generation targets, and also any landscape and visual effects on the wider area, residential property and in particular, those viewpoints considered as more sensitive by NatureScot and Argyll and Bute Council through previous consultation (for example, see Paragraph 3.3.6).

5.1.39 This assessment was also conducted within the on-site constraints identified by other EIA teams to ensure no element of the proposed infrastructure was moved to, for example an area of deep peat, a known archaeological site or to an area which may have a significant impact on ecology or ornithology. This is not only good practice in wind farm design but additionally ensures compliance with design policy (see Section 3).

5.1.40 Following this review, a decision was made to revert back to locations akin to the Consented Development / Scoping Layout. Whilst this will lead to a less efficient wind farm than that promoted at the public exhibition, this reversion has occurred as a direct response from concerns raised by NatureScot and Argyll and Bute Council to the landscape and visual impacts of the Proposed Development. The final design aims to balance the visual impacts of the scheme with overall energy yield (see Figure 5 (Design Statement), as well as Figure 1.3: Site Location Plan (EIAR Volume 2b)).

5.1.41 Feedback was also received from these two organisations in regard to the landscape and visual impacts of aviation lighting, with mitigation measures proposed by them. The potential for this has been assessed and is further detailed in Chapter 16 of the EIAR (Volume 2a) Aviation. Whilst this has not led to any immediate design changes in regard to the aviation lighting, as the suggested mitigation would not currently be accepted as safe by the Civil Aviation Authority (CAA), it is proposed that when this is deemed acceptable by the CAA, it will be incorporated into the Proposed Development; however, until then the necessary lighting for aviation safety will be installed.

5.1.42 Further site surveys conducted for the EIA have also led to small design changes to turbine layouts and other infrastructure, including access tracks:

- Additional peat probing led to the repositioning of turbines and also re-alignment of sections of the internal track to avoid deep peat (see Chapter 11 of the EIAR (Volume 2a) Geology, Hydrology and Hydrogeology for further information),
- Swept path analysis and detailed modelling to accommodate turbine delivery has led to the widening of the access track leading from the A83 to the main site and the addition of a temporary turbine laydown area on the western side of the A83, and
- Further archaeological survey led to the recording of sheilings[3] within the route of the access track at the time of the survey. The track was then re-aligned to avoid the

[3] Sheilngs are post-medieval huts associated with livestock farming

destruction of these sheilings, whilst also avoiding deep peat (see Chapter 12 of the EIAR (Volume 2a) Cultural Heritage for further information).

5.1.43 Design Review 11 has led to the finalised design and layout for the Proposed Development, which includes a 30MW battery storage facility to be installed in the construction compound towards the end of construction, and a temporary concrete batching plant in order to process material from the on-site temporary quarries ('borrow pits') within the Development Site. The proposed increase in turbine size and the addition of battery storage would result in an almost 100% increase in output from the Proposed Development in comparison to the Consented Development.

5.1.44 The Proposed Development is described in detail within Chapter 3 of the EIAR (Volume 2a): Project Description. Key features include:

- There are seven turbines with a maximum tip height of 185m and five with a maximum tip height of 200m: The reason for this difference is to reflect the topography of the site, with the resulting wind turbines appearing more uniform than if they were all the same size,
- Transformers will be located outside and immediately adjacent to the wind turbines. The EIA has assumed they will each have a maximum footprint of 5m x 3m as a 'worst-case' scenario,
- The battery storage facility is to be located within the construction compound towards the end of the construction period. It will have an approximate area of 75m x 60m and be comprised of a maximum of 27 containers not exceeding 2.6m high. The facility will be surrounded by a 2.5m high security fence,
- This construction compound / battery storage facility, as well as the nearby substation, are located within an area of forestry which is not scheduled to be felled until at least 2041 to 'post-2045' in the updated Carradale Land Management Plan (FLS, *unpublished*). This forestry is therefore expected to screen the battery storage facility for much of its lifespan. The area immediately surrounding the facility is also proposed to be restocked with mixed conifers and Sitka spruce following being felled (FLS, *unpublished*),
- The proposed new temporary quarries ('borrow pits') have been located within the Development Site in areas where there are no identified constraints (such as water courses or deep peat). Following completion of construction activities, five of the small temporary quarries would be reinstated using excess spoil generated during the works. One of the borrow pits is currently used by FLS and it is likely that they will continue this use following construction of the Proposed Development, and
- Existing track access is proposed for use where possible, including the 6km access track leading from the A83 to the main Development Site, and the 2.1km of existing forestry tracks within the main Development Site. The 8.9km of new access tracks proposed within the main Development Site have been positioned following the results of the EIA (including peat probing and archaeology), as well as through discussion with FLS who propose to use the tracks following the construction of the Proposed Development for ongoing forestry works.

6. Conclusion

6.1.1 As outlined throughout the Design Statement, the Applicant has addressed a wide range of physical, environmental and technical issues during the development of the wind farm design and the Proposed Development is based on a thorough understanding and appreciation of local character and circumstances. The final design of the Proposed Development was the result of several stages of design iteration, informed by analysis of national and local policy, the environmental baseline, technical constraints, financial viability and comprehensive engagement and consultation.

6.1.2 As a direct consequence of the site selection and design process outlined within this Design Statement, the Proposed Development contains considerable embedded mitigation which is detailed in full in Chapter 3: Project Description (EIAR Volume 2a). This includes (but is not limited to):

- Viewshed analysis used to select site based on a number of factors, including minimal visual impact,
- Avoidance of internationally and nationally designated areas,
- Reduction in number of turbines from 53 to 12, thus materially reducing the scale and extent of impacts, including ornithological and landscape and visual,
- Wind farm layout designed based on the landscape and visual effects on the wider area, residential property and in particular, those viewpoints considered sensitive by NatureScot and Argyll and Bute Council through previous consultations,
- Minimisation of land take through optimised site and track layout and design,
- Appropriate siting of turbines (to minimise landscape, visual and noise impacts),
- Avoidance of sensitive features and receptors, including hen harriers, red-throated divers and Greenland white-fronted geese,
- Bat collision risk mitigation is embedded into the design and comprises appropriately sized key-holing of turbines in forestry (100m key-holing, which is more than the precautionary 84m key-hole sizes required for the Proposed Development),
- Minimising impact on archaeological assets, such as track redesign to avoid sheilings following the most recent archaeological survey in July 2021,
- Five of six on-site temporary quarries or ‘borrow pits’ to be reinstated and re-vegetated,
- The use of on-site temporary quarries is likely to reduce the amount of HGV traffic for construction of the Proposed Development by up to 75% compared to importing 100% of stone requirements from elsewhere, and
- Ensuring the layout of wind turbines and other infrastructure associated with the Proposed Development avoids areas of deep peat.

7. References

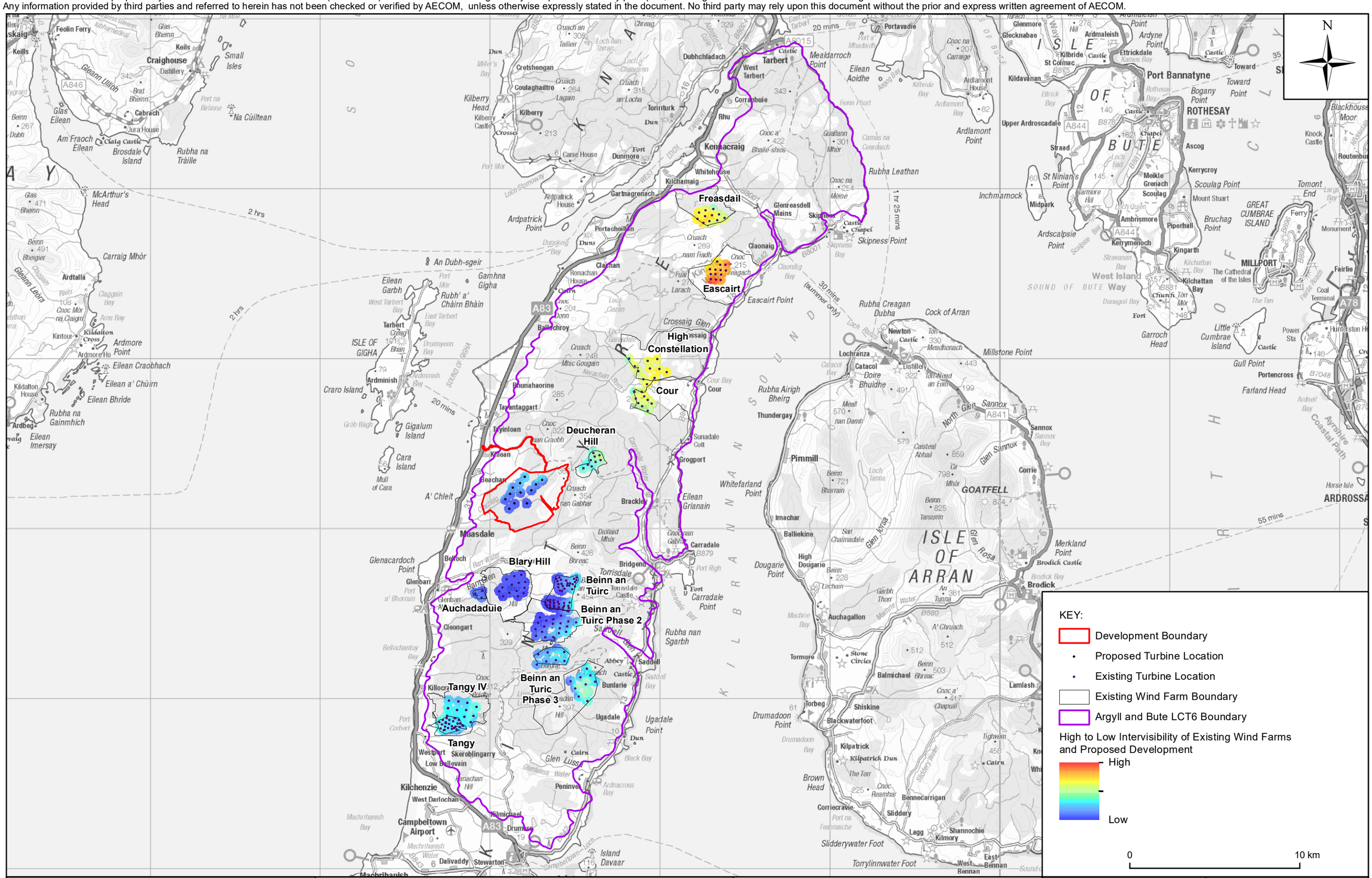
- Argyll and Bute Council (2015) Local Development Plan. (online) https://www.argyll-bute.gov.uk/sites/default/files/written_statement_0_1_ac.pdf. [Accessed 5 July 2021].
- Argyll and Bute Council (2016) Local Development Plan: Supplementary Guidance. (online) https://www.argyll-bute.gov.uk/sites/default/files/supplementary_guidance_adopted_march_2016_env_9_added_june_2016_ac2.pdf. [Accessed 5 July 2021].
- Argyll and Bute Council (2016) Local Development Plan: Supplementary Guidance 2. (online) https://www.argyll-bute.gov.uk/sites/default/files/supplementary_guidance_2_document_adopted_december_2016_3_ac.pdf. [Accessed 5 July 2021].
- Argyll and Bute Council (2016) Local Development Plan: Supplementary Guidance 2: Wind Farm Map 1. (online) https://www.argyll-bute.gov.uk/sites/default/files/spatial_framework_a0_small_ac.pdf. [Accessed 5 July 2021].
- Argyll and Bute Council (2016) Local Development Plan: Supplementary Guidance 2: Wind Farm Map 2. (online) https://www.argyll-bute.gov.uk/sites/default/files/spatial_framework_showing_constituents_a0r_ac.pdf. [Accessed 5 July 2021].
- Argyll and Bute Council and Scottish Natural Heritage (2017) Argyll and Bute Landscape Wind Energy Capacity Study (updated from 2012). https://www.argyll-bute.gov.uk/planning-and-environment/landscape-wind-energy-capacity-study. [Accessed 6 July 2021].
- FLS (*unpublished*) Updated Carradale Land Management Plan (title to be determined).
- Scottish Executive (2003) Planning Advice Note 68: Design Statements. (online) https://www.gov.scot/publications/planning-advice-note-68-design-statements/. [Accessed 8 April 2021].
- Scottish Government (2015) Circular 3/2013 Development Management Procedures, as amended. (online) https://www.gov.scot/publications/planning-series-circular-3-2013-development-management-procedures-2/. [Accessed 8 April 2021].
- Scottish Government (2019a) Report to the Scottish Ministers: Case Reference PPA-130-2064 (Clachaig Glen Windfarm).
- Scottish Government (2019b) The Global Climate Emergency - Scotland's Response: Climate Change Secretary Roseanna Cunningham's statement. (online) https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/. [Accessed 7 April 2021].
- Scottish Government (2020) Scottish Planning Policy (as revised). (online) https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-

guidance/2020/12/scottish-planning-policy/documents/scottish-planning-policy/scottish-planning-policy/govscot%3Adocument/scottish-planning-policy.pdf. [Accessed 8 July 2021].

Clachaig Glen Wind Farm

Design Statement Figures

Figures: 1; 2; 3



Client: RWE	Title: FIGURE 1 VIEWSHED ANALYSIS WITHIN LCT6	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	Drawn: LC / Checked: LC
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			Verified: AR / Approved: SW
			Date: FEBRUARY 2022 / Scale at A3: 1:200,000
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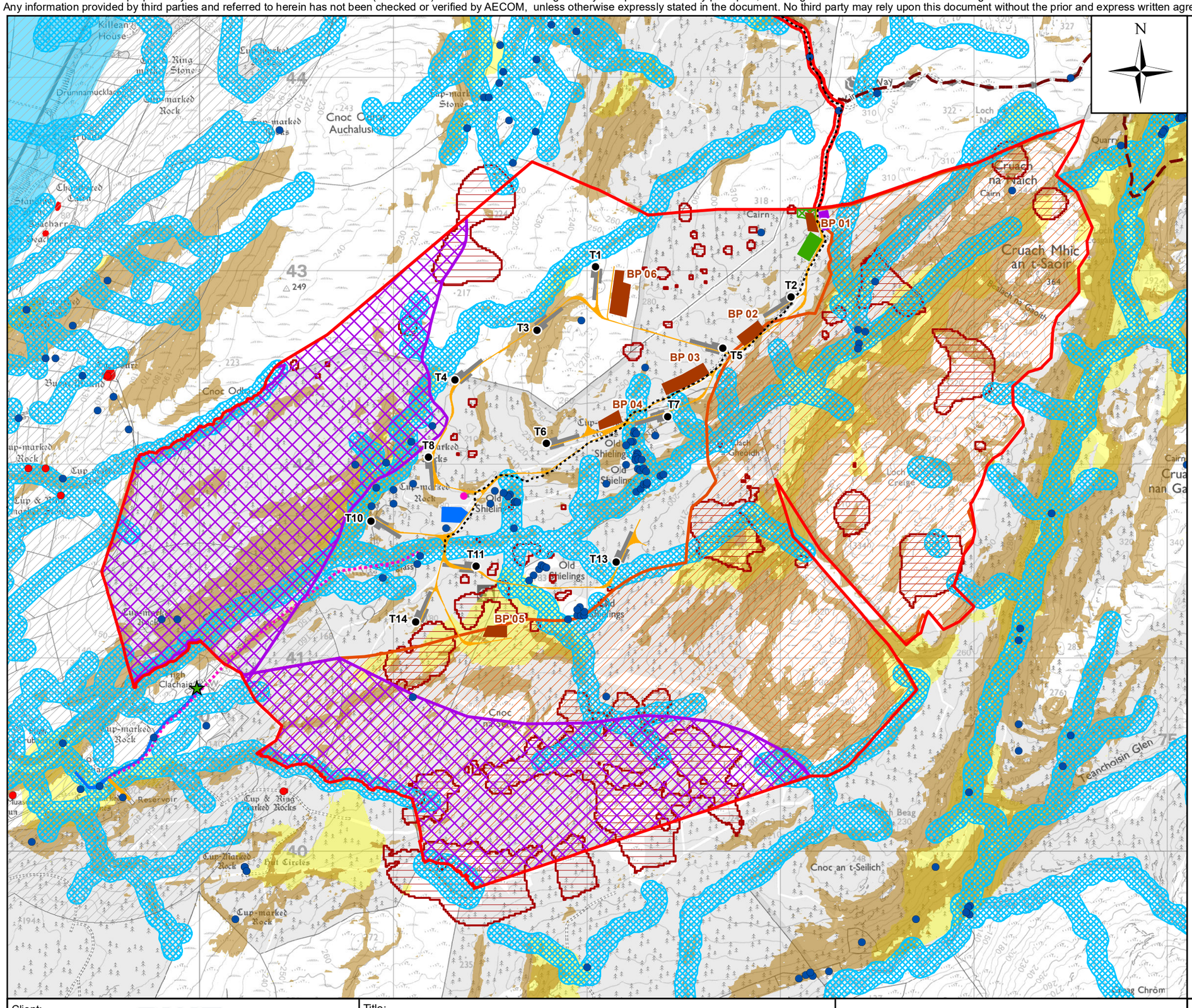

KEY:

- Development Site
- Proposed Turbine Location
- Proposed Met Mast Location
- FLS Existing Road
- Proposed Access Track
- Proposed Crane Pad and Laydown Area
- Proposed Construction Compound including Battery Storage
- Proposed Substation
- Temporary Blade Laydown Area
- Indicative Borrow Pit Location
- Residential Dwelling - 750m Buffer
- Recreational Route
- Watercourse/Water Feature - 50m Buffer
- Slope > 16%
- Peat > 2.0m (Results from Interpolated Surface)
- Wind Yield Constraint - Unsuitable for Development
- Less Preferred Area Identified by Residents and for Reasons of Landscape Protection (Consented Development)
- High Risk Ornithological Constraint (Consented Development)
- FLS Quarry Area
- Area of Panoramic Quality
- Scheduled Monument (Area)
- Scheduled Monument (Point)
- Listed Building
- Known Archaeology
- Private Water Supply

Scottish Water Infrastructure

- Distribution main
- Mains (abandoned)
- Mains (isolated)

Client: RWE

Project: CLACHAIG GLEN WIND FARM
ENVIRONMENTAL IMPACT ASSESSMENT

Title:
FIGURE 2
FINAL LAYOUT AND CONSTRAINTS

AECOM
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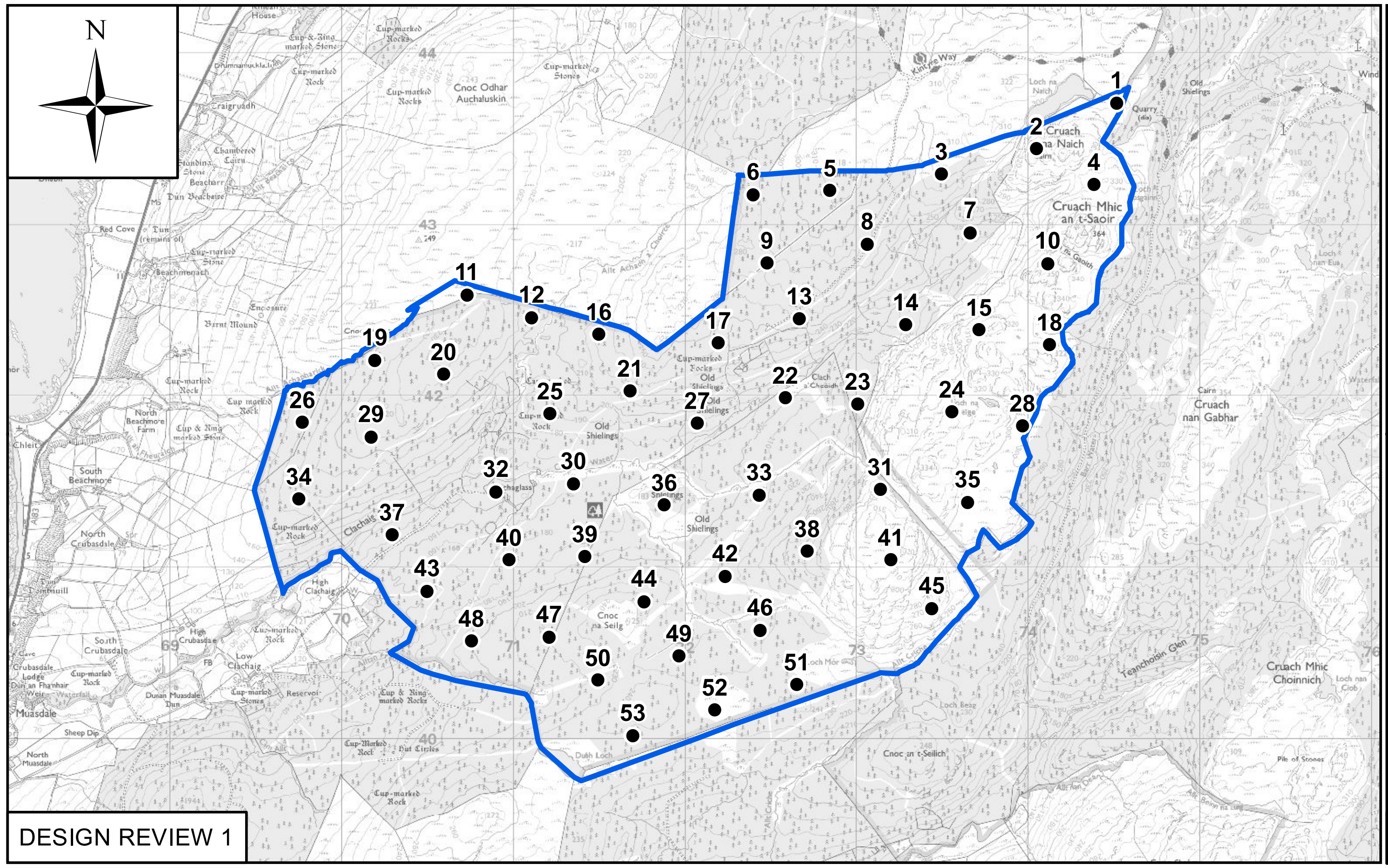
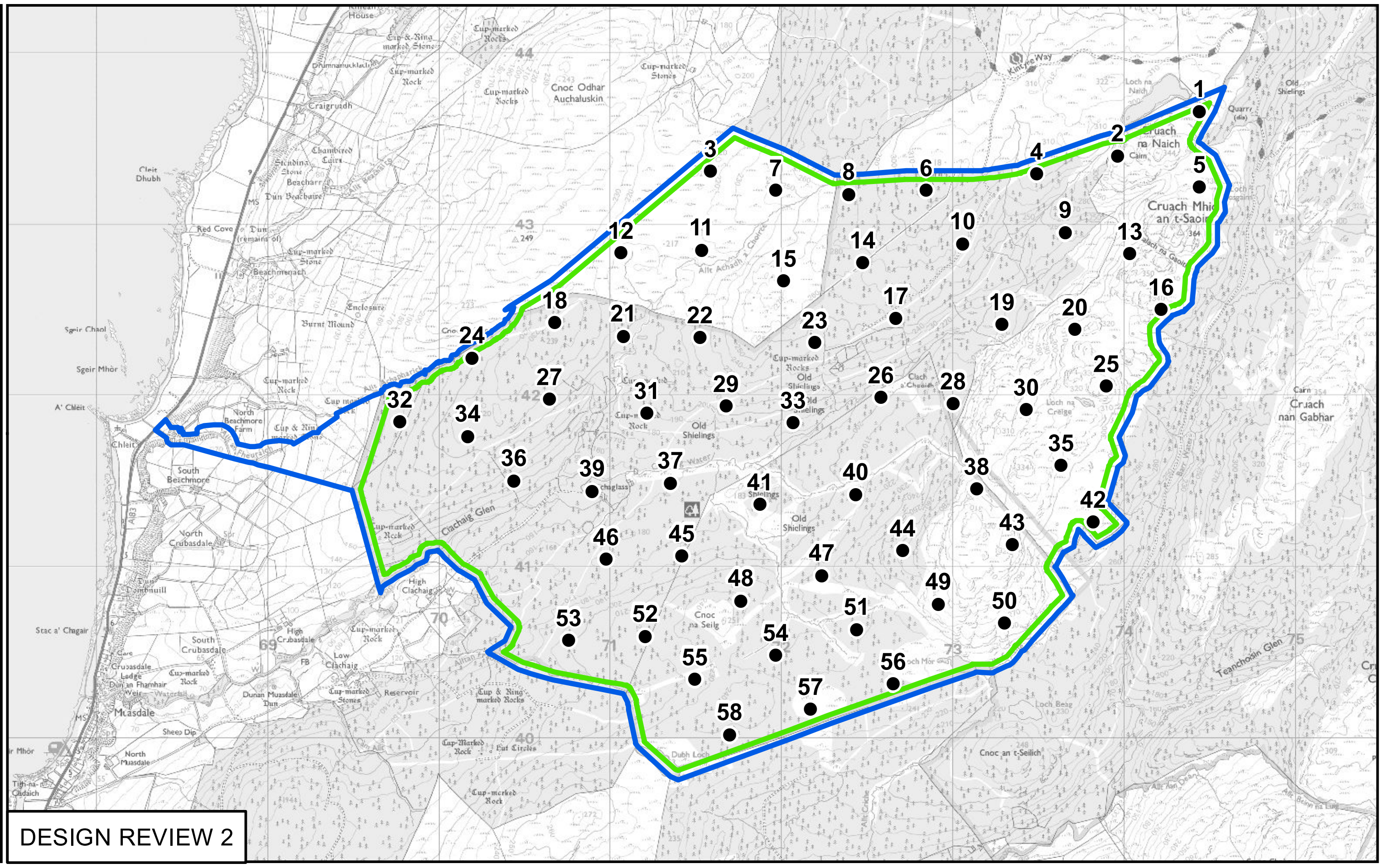
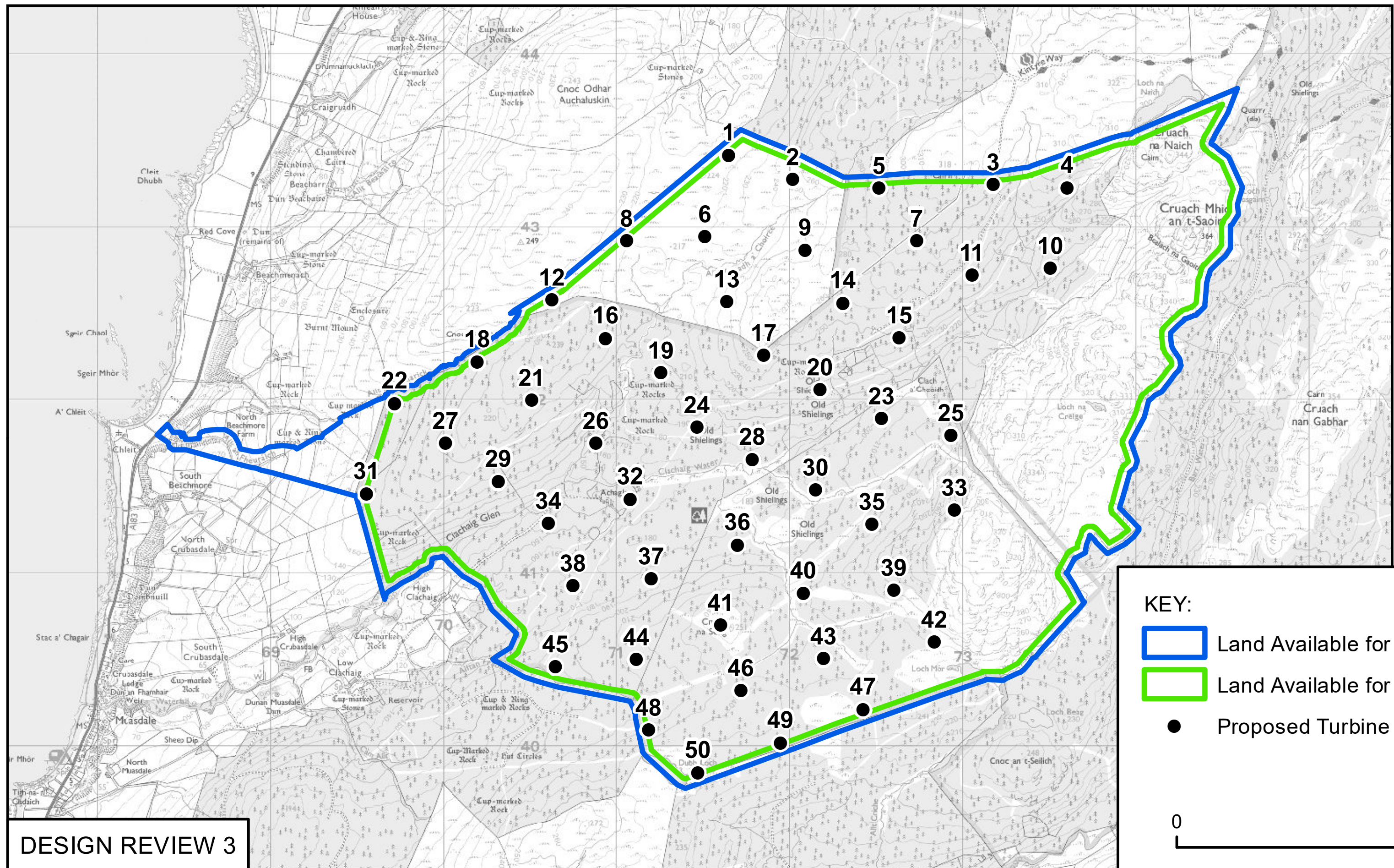
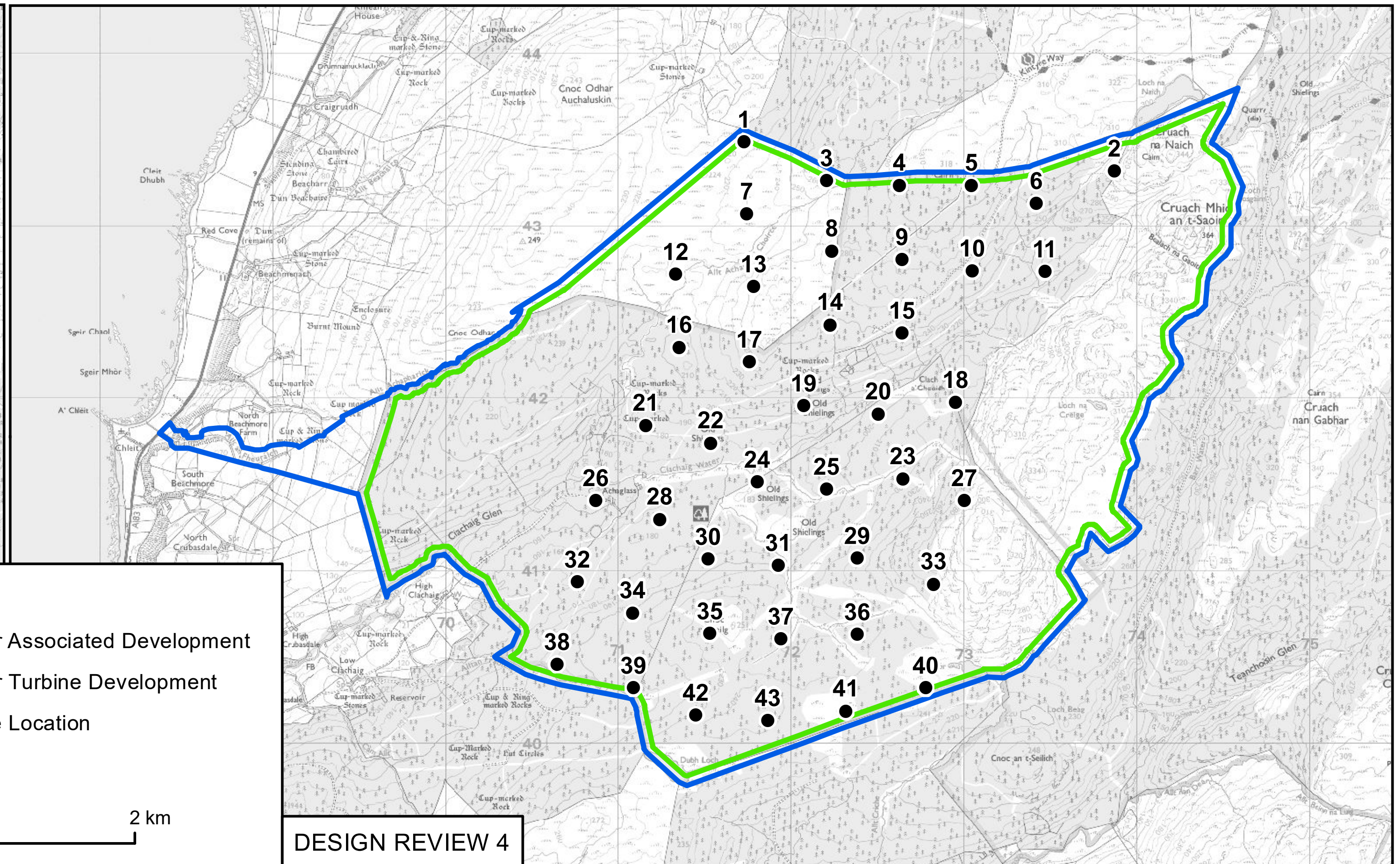
Drawn:	LC	Checked:	AR
Verified:	RB	Approved:	SW
Date:	JANUARY 2022	Scale at A3:	1:20,000
Drawing Number:	CG_220105_DS2_v1		A3









KEY:
- Land Available for Associated Development
- Land Available for Turbine Development
- Proposed Turbine Location

0 — 2 km

Client: RWE	Title: FIGURE 3 DESIGN REVIEW: ITERATIONS 1 - 4	Drawn: LC	Checked: AR
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT		Verified: RB	Approved: SW
		Date: JANUARY 2022	Scale at A3: 1:40,000
		Drawing Number: CG_220105_DS3_v1	A3

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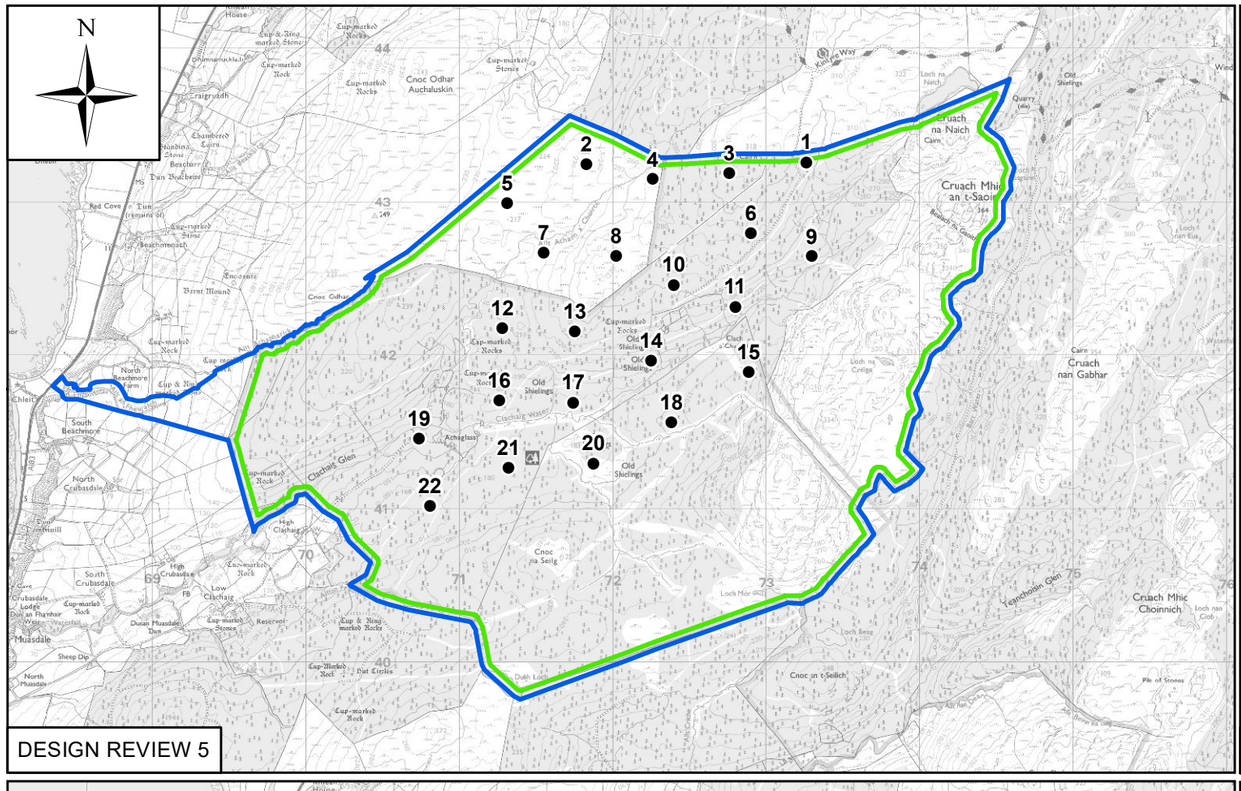
RWE

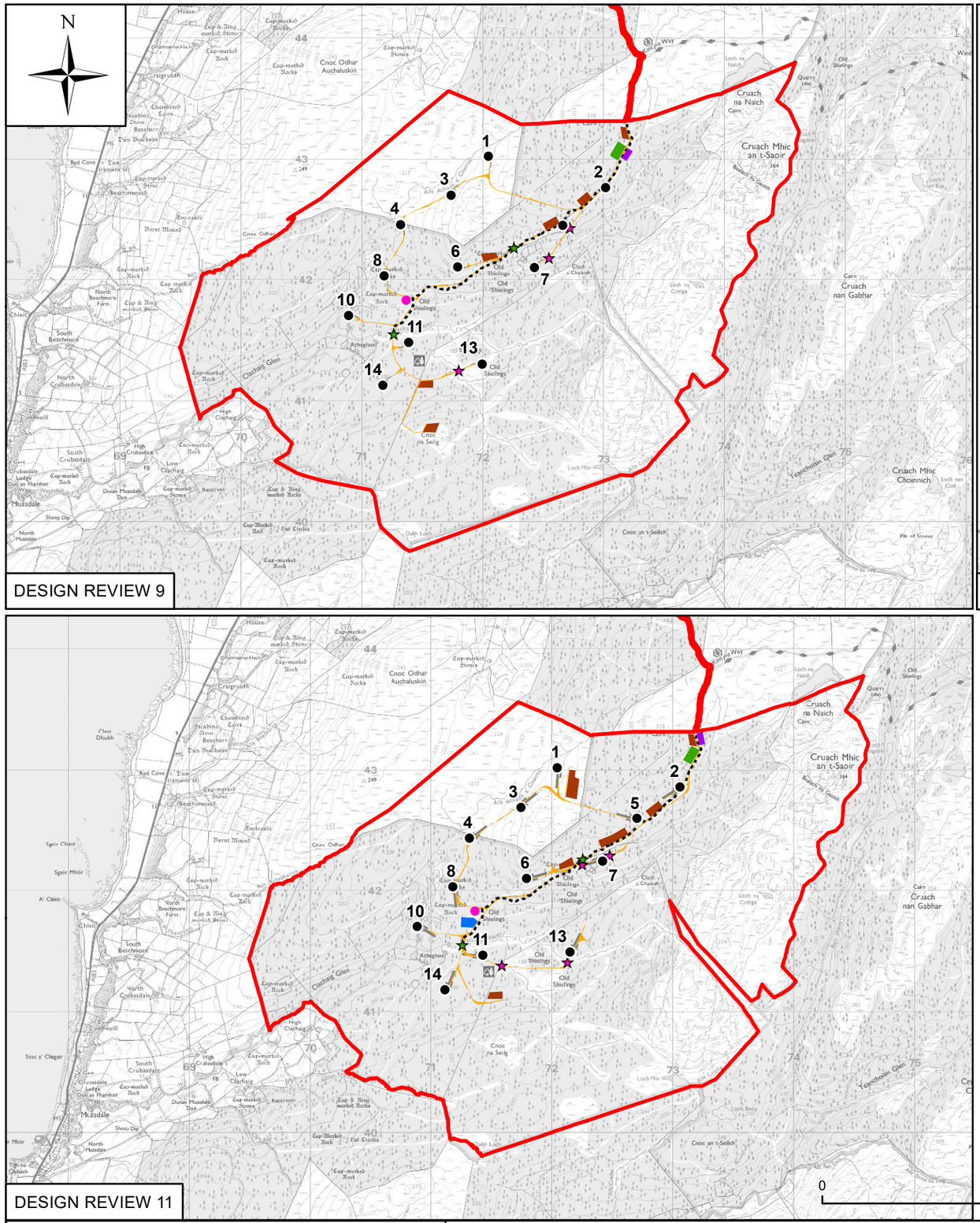
Clachaig Glen Wind Farm

Design Statement Figures

Figures: 4; 5



Client: RWE	Title: FIGURE 4 DESIGN REVIEW: ITERATIONS 5-8	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	Drawn: LC / Checked: AR Verified: RB / Approved: SW Date: JANUARY 2022 / Scale at A3: 1:40,000 Drawing Number: CG_220105_DS4_v1 / A3
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			



KEY:

- Development Site
- Proposed Turbine Location
- Proposed Met Mast Location
- Proposed Watercourse Crossing of Existing Track
- Proposed New Watercourse Crossing
- FLS Existing Road
- Proposed Access Track
- Proposed Crane Pad and Laydown Area
- Proposed Construction Compound including Battery Storage
- Proposed Substation
- Temporary Blade Laydown Area
- Indicative Borrow Pit Location

Client: RWE

Project: CLACHAIG GLEN WIND FARM
ENVIRONMENTAL IMPACT ASSESSMENT

Title:

FIGURE 5
DESIGN REVIEW: ITERATIONS 9-11

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Verified:	RB	Approved:	SW
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Drawing Number:	CG_220105_DS5_v1		A3

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